United States
Department of
Agriculture

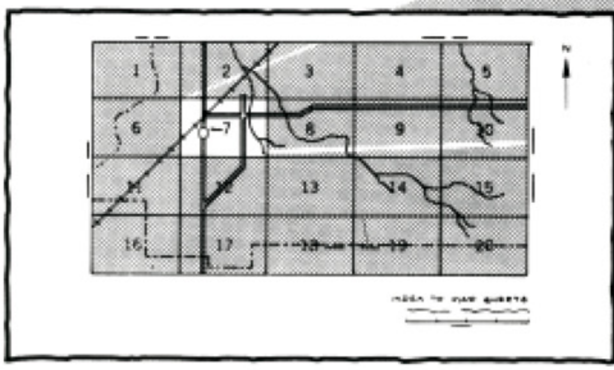
Soil
Conservation
Service

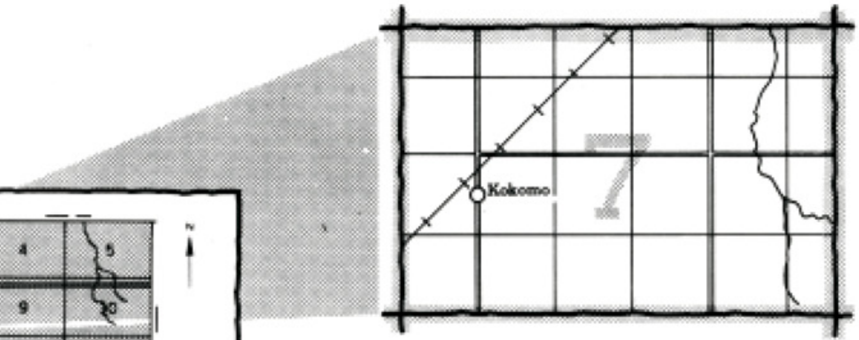
In cooperation with
Tennessee Agricultural
Experiment Station,
Obion-Forked Deer River
Basin Authority,
Crockett County Board of
Commissioners, and
Tennessee Department of
Agriculture

Soil Survey of Crockett County, Tennessee

HOW TO USE

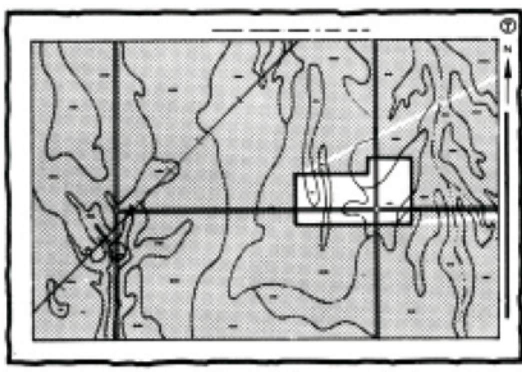
1. Locate your area of interest on the "Index to Map Sheets"

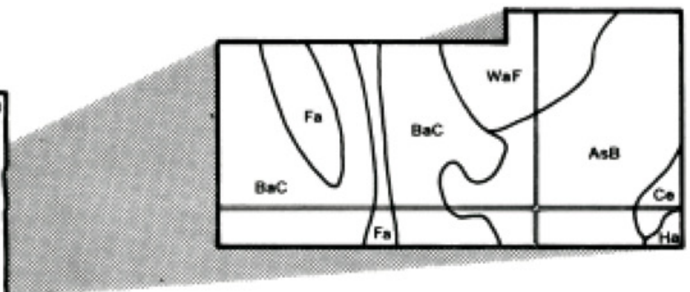




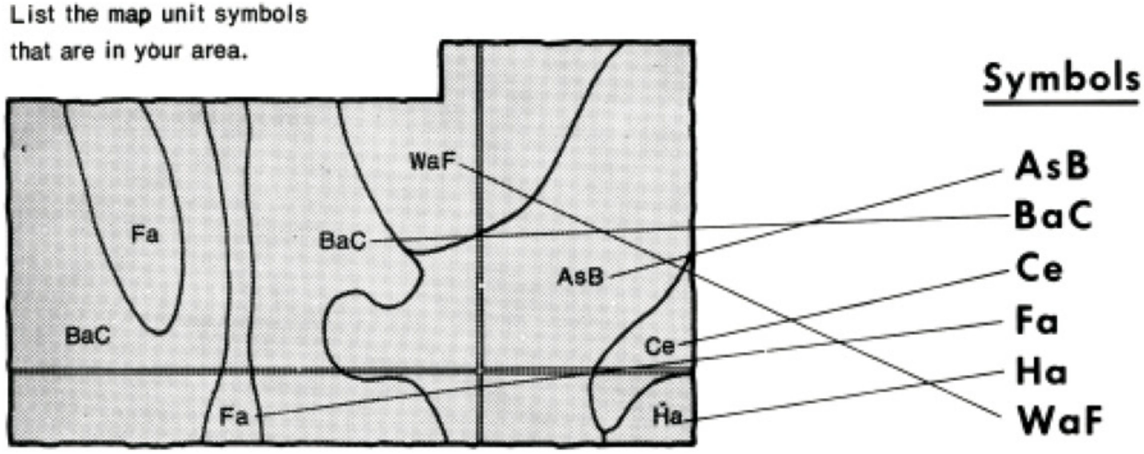
2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.



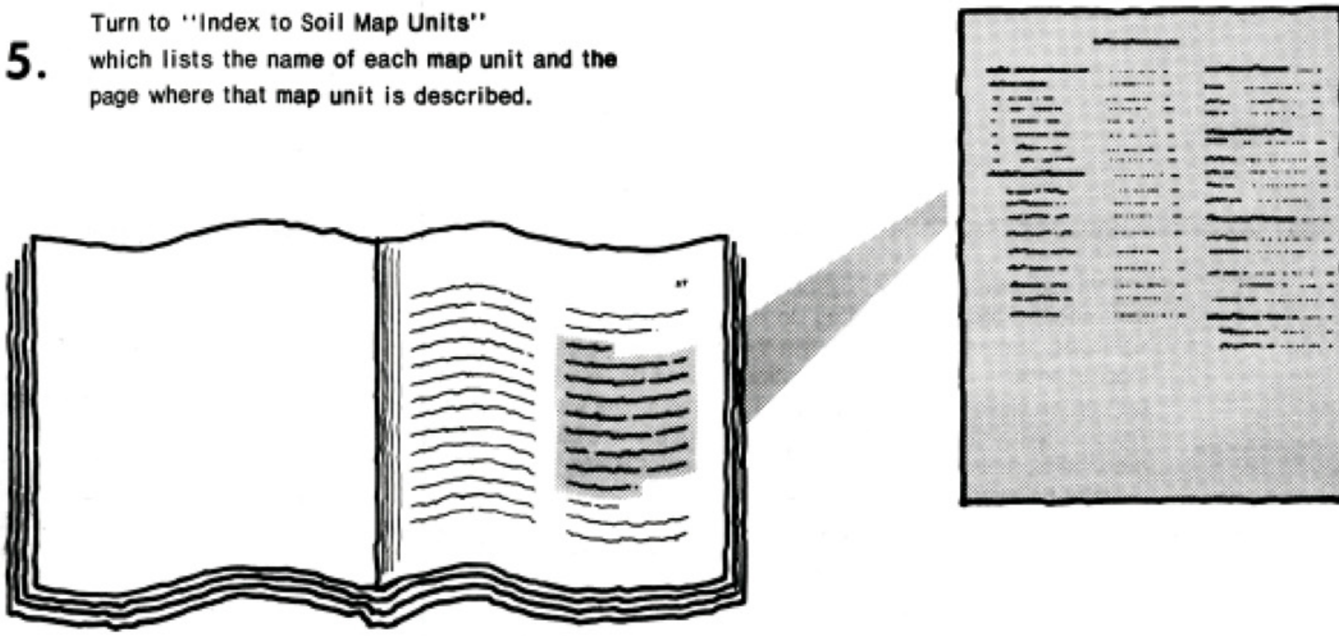


4. List the map unit symbols that are in your area.

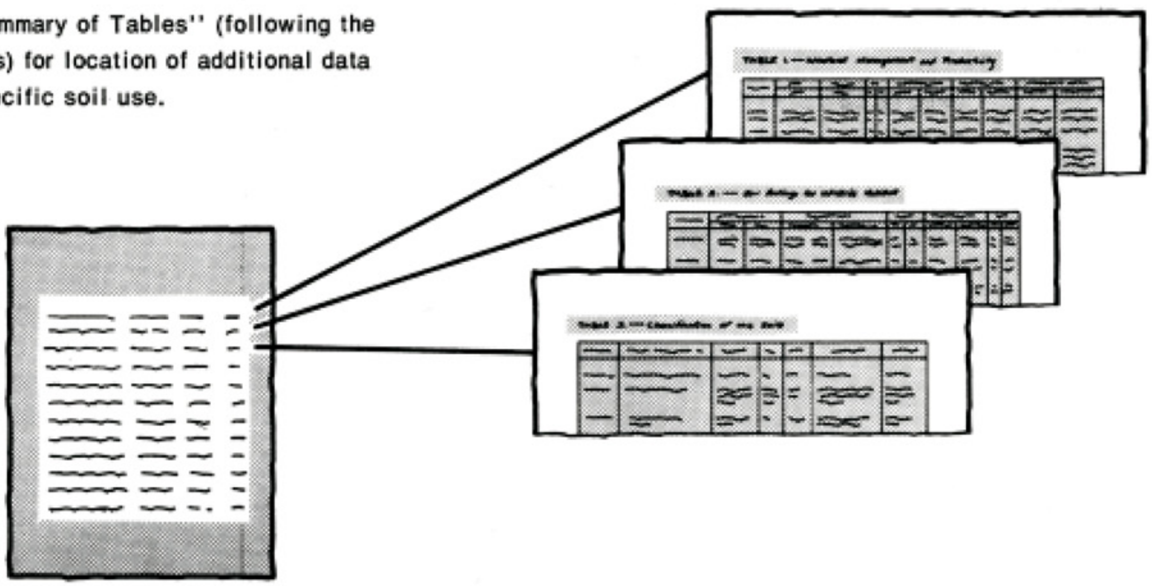


THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1983. Soil names and descriptions were approved in 1985. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1983. This soil survey was made cooperatively by the Soil Conservation Service and the Tennessee Agricultural Experiment Station, the Obion-Forked Deer River Basin Authority, the Crockett County Board of Commissioners, and the Tennessee Department of Agriculture. It is part of the technical assistance furnished to the Crockett County Soil Conservation District. The Tennessee Valley Authority provided funds to assist with map compilation.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

All programs and services of the Soil Conservation Service are offered on a nondiscriminatory basis, without regard to race, color, national origin, religion, sex, age, marital status, or handicap.

Cover: Cotton on Grenada soil is planted on the contour to control runoff and erosion. Crockett County is one of the leading cotton producing counties in the state.

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Soil Series

Issued June 1988

Index to Map Units

Summary of Tables

Foreword

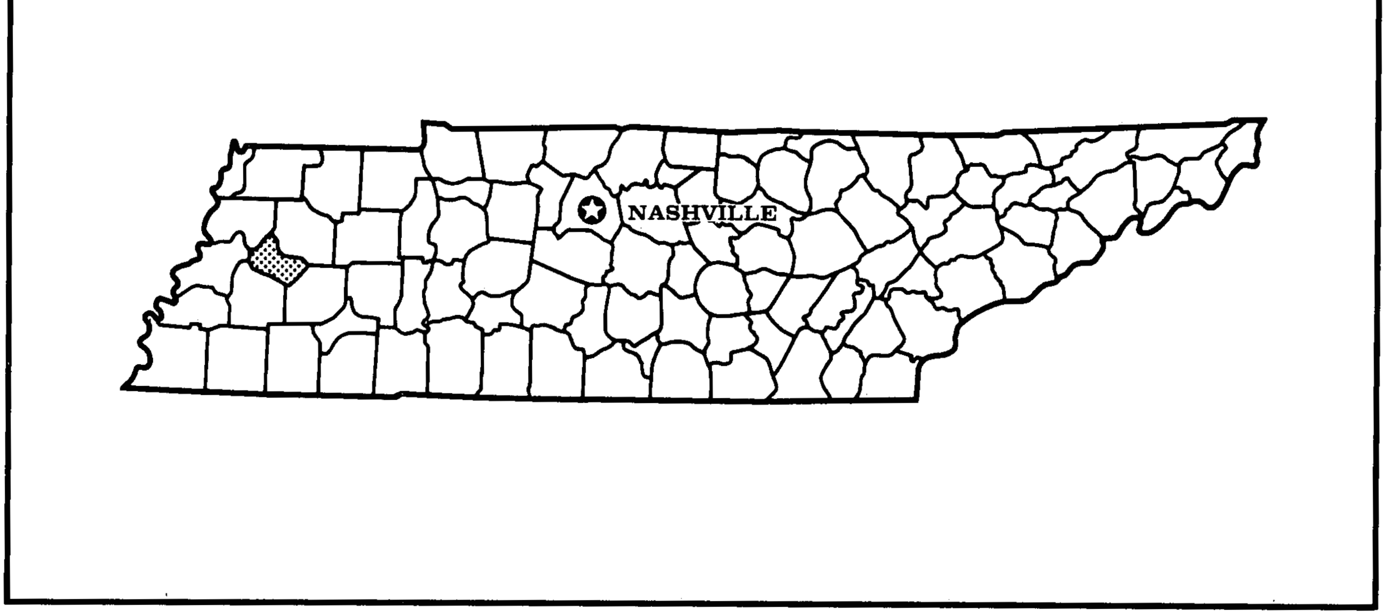
This soil survey contains information that can be used in land-planning programs in Crockett County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to insure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes soils poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.

Donald C. Bivens
State Conservationist
Soil Conservation Service



Location of Crockett County in Tennessee.

Soil Survey of Crockett County, Tennessee

By William T. Brown, Soil Conservation Service

Fieldwork by William T. Brown, Soil Conservation Service;
Gary Blackwood, Mark Dorsett, Robert Fulwood, and
Rector H. Moneymaker, Crockett County

United States Department of Agriculture,
Soil Conservation Service
In cooperation with
Tennessee Agricultural Experiment Station,
Obion-Forked Deer River Basin Authority,
Crockett County Board of Commissioners,
and Tennessee Department of Agriculture

General Nature of the Survey Area

CROCKETT COUNTY is in west-central Tennessee. It is bounded on the northwest by Dyer County, on the northeast by Gibson County, on the southeast by Madison County, on the southwest by Haywood County, and on the west by Lauderdale County.

Crockett County has a land area of 172,200 acres, or about 269 square miles. Alamo, the county seat, is located near the center of the county. The population of the county in 1980 was 14,914.

Settlement

Crockett County was once part of a vast area inhabited by the Chickasaw Indians. A treaty signed in 1818 opened the area for white settlement. The first settlers arrived about 1823. The county was formed in 1871 from parts of Gibson, Haywood, Dyer, and Madison counties. Crockett County was named in honor of Davy Crockett. The legislative act that established the county specified that the county seat be named Alamo, in honor of the Texas mission where Crockett was killed.

Retail trade and agriculture are the principal sources of income. Principal industries include vegetable processing, clothing manufacture, electronics parts, transformers, lumber and wood products, and molded plastics.

Natural Resources

Soil is the most important natural resource in the county. Cultivated crops, hay crops, timber products, and pastured livestock are marketable products that are dependent upon the soil.

In most of the county, water is adequate for domestic use and for watering livestock. Major sources of water are wells, ponds, and lakes. Many farm ponds provide water for farm animals, wildlife, and recreation.

Lignite deposits exist in parts of the county, and some natural gas and oil deposits could someday have commercial value.

Physiography and Geology

Crockett County is on the West Tennessee Plain, which is a local part of the Southern Mississippi Valley Silty Uplands Major Land Resource Area. Nearly level to moderately sloping ridgetops that have been dissected by a young, dendritic drainage system dominate the uplands in the county. Hillsides are moderately sloping to moderately steep and are short to medium in length. Broad, flat bottom lands are on flood plains of the streams and their major tributaries.

The geology of the area has not been mapped in detail. The soils of the uplands were mainly formed in deposits of loess ranging from about 5 to about 15 feet

in thickness. The loess deposits generally thin from west to east. In a few places, the loess has been removed by erosion, exposing the reddish, loamy Coastal Plain sediments that underlie the loess.

The loess is of Quaternary age. In most places, two layers of loess can be recognized, the upper layer representing the Peorian loess, and the underlying layer representing the Roxana loess. A third, somewhat thinner layer is recognizable in places immediately above and in many places partly mixed with the Coastal Plain sediments. This layer is believed to correspond to the Loveland loess.

The underlying Coastal Plain sediments are mostly reddish and coarsely stratified. They range in texture from clay loam to loamy sand. In most places, an ancient soil has partly obliterated the stratification. The modern flood plain deposits are of Quaternary or Recent origin.

Crockett County is almost entirely drained by the Middle and South Forks of the Forked Deer River and its tributaries.

Climate

Prepared by the National Climatic Data Center, Asheville, North Carolina.

Table 1 gives data on temperature and precipitation for the survey area as recorded at nearby Brownsville, Tennessee, in adjacent Haywood County, in the period 1951 to 1981. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 41 degrees F, and the average daily minimum temperature is 31 degrees. The lowest temperature on record, which occurred at Brownsville on January 24, 1963, is -10 degrees. In summer the average temperature is 79 degrees, and the average daily maximum temperature is 90 degrees. The highest recorded temperature, which occurred on August 16, 1954, is 106 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (50 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 51 inches. Of this, 25 inches, or about 50 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 21 inches. The heaviest 1-day rainfall during the period of record was 6.7 inches at Brownsville on January 29, 1956. Thunderstorms occur on about 53 days each year, and most occur in summer.

The average seasonal snowfall is 6 inches. The greatest snow depth at any one time during the period of record was 11 inches. On an average of 4 days, at least 1 inch of snow is on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 55 percent. Humidity is higher at night, and the average at dawn is about 80 percent. The sun shines 70 percent of the time possible in summer and 55 percent in winter. The prevailing wind is from the south. Average windspeed is highest, 11 miles per hour, in spring.

Severe local storms, including tornadoes, may strike in or near the area occasionally, but they are of short duration and damage is variable and spotty.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; and the kinds of crops and native plants growing on the soils. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material from which the soil formed. The unconsolidated material is generally devoid of roots and other living organisms and has been little changed by other biological activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, the landforms, relief, climate, and the natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with considerable accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, acidity, and other features that enable them to identify soils. After

describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area are generally collected for laboratory analyses and for engineering tests. Soil scientists interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties in terms of expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and new interpretations sometimes are developed to meet local needs. Data were assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management were assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can state with a fairly high degree of probability that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by several kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. In the detailed soil map units, these latter soils are called inclusions or included soils. In the general soil map units, they are called soils of minor extent.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed, and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soils on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map is a unique natural landscape. Typically, a map unit consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in other units but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or a building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The soils at the boundaries of the general soil map at the back of this publication do not match, in all instances, those of adjacent counties. Differences in the maps result from the differences in soil patterns, different map scales, and recent advances in soil classification.

1. Arkabutla-Rosebloom

Nearly level, somewhat poorly drained and poorly drained soils; on flood plains

This map unit consists of soils on the broader, wetter flood plains along the South Fork and the Middle Fork of the Forked Deer River. In most areas, these soils are flooded nearly every winter and spring. Slopes range from 0 to 2 percent. The natural vegetation is mostly bottom land hardwoods, but in the wettest areas, stands of baldcypress, water tupelo, and wetland shrubs and sedges predominate.

Most of the acreage of this map unit is wooded. Several large fields have been cleared and partly drained by systems of ditches and levees. Most of the drained areas are used to grow soybeans, if wetness does not prevent planting. Harvesting is also difficult or impossible in some years because of wetness.

This map unit makes up about 8 percent of the survey area. It is about 50 percent Arkabutla soils and 40 percent Rosebloom soils. Calhoun and Center are minor soils of this map unit.

Arkabutla soils are deep, silty, and somewhat poorly drained. They are on the slightly higher part of the large flood plains because they have received more sediment than the Rosebloom soils.

Rosebloom soils are deep, silty, and poorly drained. They formed on the lowest part of larger flood plains. Slow-moving or standing water recedes slowly from areas of these soils, leaving only a small amount of sediment each year.

The soils of this map unit are suitable for trees. Most locally adapted bottom land hardwoods grow well, except in areas that remain ponded for several months of each year. These ponded areas are dominated by baldcypress and water tupelo, and by wetland shrubs and sedges. Logging operations are restricted to dry periods during summer and fall. Soils of this map unit provide important food and habitat for wildlife.

The soils of this map unit have severe limitations for building site development and sanitary facilities because of wetness and the hazard of flooding.

2. Grenada-Loring-Adler

Nearly level to moderately steep, moderately well drained soils; on uplands and narrow flood plains

In this map unit, the landscape is characterized by relatively broad, gently sloping, loess-covered ridgetops and moderately sloping and strongly sloping hillsides. A few short, moderately steep hillsides, however, form major breaks in the landscape. Narrow drainageways and tributary streams dissect areas of these soils.

Most of the acreage of this map unit is in crops, mainly cotton, soybeans, and corn. Some acreage is in hay or pasture. Erosion rates are the highest in the county for these soils if row crops are grown without proper conservation tillage.

This map unit makes up about 56 percent of the survey area. It is about 32 percent Grenada soils, 32 percent Loring soils, and 20 percent Adler soils. Center, Memphis, Lexington, Smithdale, and Calloway are minor soils of this map unit.

Grenada soils are deep, silty, and moderately well drained. They have a compact, slowly permeable fragipan in the subsoil. These soils are on broad ridgetops and on moderately sloping hillsides below the highest ridges on the landscape. Slopes range from 2 to 8 percent.

Loring soils are deep, silty, moderately well drained, and they have a slowly permeable fragipan. These soils are mostly on narrower and higher ridgetops than the Grenada soils, and on moderately sloping to moderately steep hillsides. They formed in thick loess deposits. Slopes are 2 to 20 percent.

Adler soils are deep, silty, and moderately well drained. They are in drainageways and on narrow flood plains of tributary streams that dissect the uplands. These soils are subject to occasional flooding.

The nearly level Adler soils on the bottom lands are highly productive cropland. The Grenada and Loring soils on the gently sloping ridgetops are also suited to crops if erosion is controlled. Slope and the hazard of erosion are the main limitations to farming the parts of the uplands that have steeper slopes. In some places, erosion has already lowered the available water capacity, so the soils are most productive under permanent cover, such as pasture or hay. Sloping areas in other places are fairly productive and can be safely cropped if conservation tillage is used to control erosion. Sites suitable for farm ponds are common, and properly constructed ponds generally hold water well.

The soils of this map unit are well suited to trees. Most locally adapted hardwoods grow well, and loblolly pines can help control gullies and sheet erosion on steeper, more severely eroded areas. The soils are seasonally wet, so summer and fall are better for logging operations.

Most of this map unit is moderately suited to building site development if central sewage systems are used. Most of the soils have low strength, so design and construction of roads are important. Slow permeability and seasonal wetness are severe limitations for septic tank absorption fields. The Adler soils have severe limitations for building site development and sanitary facilities because of flooding.

3. Adler-Morganfield-Arkabutla

Nearly level, well drained to somewhat poorly drained soils; on flood plains

This map unit consists of long strips of soils formed in deep, silty alluvial deposits along the creeks. Slopes are 0 to 2 percent. Most areas of these soils are in crops, mainly cotton and soybeans. These soils are highly productive. They are subject to occasional flooding, generally during winter or early in spring.

This map unit makes up about 14 percent of the survey area. It is about 60 percent Adler soils, 15 percent Morganfield soils, and 10 percent Arkabutla soils. Center, Routon, and Rosebloom are minor soils of this map unit.

Adler soils are deep, silty, and moderately well drained. They are in drainageways and on upper reaches of flood plains where they receive sediment from the loess-covered uplands.

Morganfield soils are deep, silty, and well drained. They are on the higher, better drained part of the flood plains, adjacent to stream channels, and on alluvial fans.

Arkabutla soils are deep, silty, and somewhat poorly drained. They are on the lower part of the flood plains.

The soils of this map unit are highly productive, and easily tilled and managed. These soils make up some of the best cropland in the county. Flooding sometimes damages crops, particularly some perennials, such as alfalfa, that are sensitive to wetness and flooding.

The soils of this map unit have severe limitations for building site development and sanitary facilities because of wetness and the hazard of flooding.

4. Center-Routon-Calhoun

Nearly level, somewhat poorly drained and poorly drained soils; on loess-covered stream terraces and low uplands

This map unit consists of somewhat poorly drained and poorly drained soils on small, nearly level, loess-covered stream terraces slightly above the present-day flood plain. Slopes are 0 to 2 percent. Most areas in this map unit are in crops, mainly soybeans, and some cotton is in the somewhat poorly drained areas. A few areas of these soils are subject to rare flooding.

This map unit makes up about 4 percent of the survey area. It is about 50 percent Center soils, 20 percent Routon soils, and 20 percent Calhoun soils. Grenada, Calloway, and Arkabutla are minor soils of this map unit.

Center soils are deep, silty, and somewhat poorly drained. They are on slight rises of the loess-covered stream terraces and in a few upland depressions.

Routon soils are deep, silty, and poorly drained. They are on low, flatter parts of the loess-covered stream terraces and upland depressions, mostly in the western half of the county.

Calhoun soils are deep, silty, and poorly drained. They are in positions similar to those of the Routon soils, mostly in the eastern half of the county.

These soils are well suited to moderately suited to use as cropland. With good management, these soils will produce favorable yields of soybeans and cotton. These soils are poorly suited to crops that are sensitive to wetness, such as alfalfa. Shallow ditches or surface smoothing can improve surface drainage on some tracts.

The soils of this map unit are well suited to trees. Most bottom land hardwoods grow well. These soils are seasonally wet, so summer and fall are better for logging operations.

This map unit is poorly suited to building site development and septic tank absorption fields because of wetness and slow permeability.

5. Grenada-Loring-Center

Nearly level to strongly sloping, moderately well drained and somewhat poorly drained soils; on uplands and

loess-covered stream terraces

This map unit consists of predominantly gently sloping and sloping, smooth uplands and loess-covered terraces with intermediate to low relief (fig. 1). Slopes are mostly 0 to 8 percent, but some are as much as 12 percent.

Most of the acreage of this map unit is used for crops, mainly cotton and soybeans. Erosion rates are high, particularly on soils that are moderately sloping and strongly sloping.

This map unit makes up about 18 percent of the survey area. It is about 45 percent Grenada soils, 20 percent Loring soils, and 15 percent Center soils. Adler, Calloway, and Arkabutla are minor soils of this map unit.

Grenada soils are deep, silty, and moderately well drained. They have a fragipan. They are on broad, gently sloping ridgetops of intermediate elevation and on moderately sloping hillsides. They formed in thick deposits of loess. Slopes are 2 to 8 percent.

Loring soils are deep, silty, and moderately well drained. They have a fragipan. They are mostly on slightly higher, more convex parts of the uplands. These soils formed in thick deposits of loess. Slopes are 2 to 12 percent.

Center soils are deep, silty, and somewhat poorly drained. They are on nearly level, loess-covered stream terraces and in saddles and depressions of uplands. Slopes are 0 to 2 percent.

The soils of this map unit are suitable mainly for cropland and pasture, where conservation tillage systems control erosion. Crops that are sensitive to seasonal wetness, such as alfalfa, are rather short-lived.

The soils of this map unit are well suited to trees. Most locally adapted hardwoods grow well. Because of the seasonal wetness, summer and fall are better for logging operations.

Figure 1.—The soils in the Grenada-Loring-Center map unit are moderately suited to urban use when measures are taken to alleviate the slow permeability and low strength limitations.

The moderately well drained soils of this map unit are moderately suited to building site development if central sewage service is available. Slow permeability and seasonal wetness are severe limitations for septic tank absorption fields. Low strength is a severe limitation for local roads and streets, but proper design can mostly overcome this limitation.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and Management of the Soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Loring silt loam, 2 to 5 percent slopes, eroded, is one of several phases in the Loring series.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

Ad—Adler silt loam, occasionally flooded. This soil is deep, nearly level, and moderately well drained. It is on flood plains, and individual areas are in long, narrow strips of about 10 to 200 acres. Slopes range from 0 to 2 percent.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
0 to 8 inches; yellowish brown silt loam

Underlying material:
8 to 27 inches; yellowish brown silt loam, mottles in shades of gray and brown
27 to 60 inches; gray silt loam, mottles in shades of brown

Included with this soil in mapping are a few small areas of the somewhat poorly drained Arkabutla soils. Also included in a few narrow bands along stream channels is a soil that has one or more layers of loamy or sandy material.

Important soil properties:

Permeability: moderate
Available water capacity: high
Natural fertility: moderate
Soil reaction: medium acid to neutral in the surface layer and strongly acid to neutral in the substratum
Flood hazard: occasional, brief duration, in winter or early in spring
High water table: seasonal, within 2 to 3 feet of the surface in winter and early in spring
Root zone: to a depth of more than 40 inches in summer; restricted by water table in winter and early in spring

In most areas, this Adler soil is used for crops, mainly soybeans (fig. 2), cotton, and corn. In some areas, the soil is used for hay or pasture.

This soil is well suited to most commonly grown crops and to use as pasture. Small grains produce high yields on this soil, but they can be damaged by occasional flooding. The soil is moderately suited to alfalfa, which grows well, but may need to be reseeded every 4 to 5 years because a seasonal high water table and occasional flooding gradually reduce the stand. Fertilizer applied according to soil test recommendations is important for sustained high yields.

This Adler soil is well suited to bottom land hardwoods, including green ash, yellow poplar, American

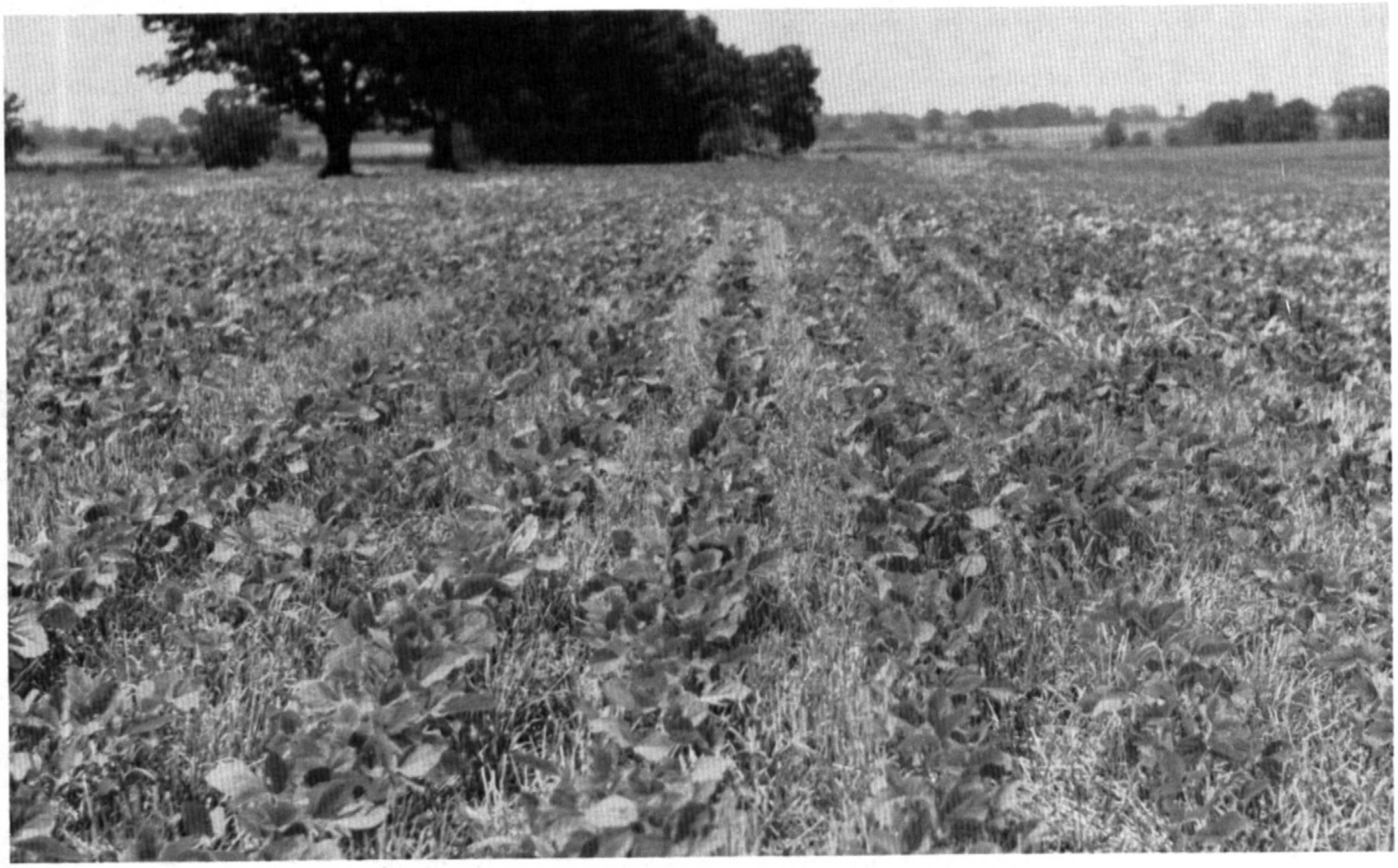


Figure 2.—Adler silt loam, occasionally flooded, is well suited to soybeans.

sycamore, and sweetgum. The main limitation for managing timber is the susceptibility of this soil to compaction and rutting. Plant competition and seedling mortality are also concerns in management. Rutting and compaction are caused by using heavy equipment during wet periods. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall and using low-pressure ground equipment will damage the soil less and help to maintain productivity. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation.

This soil is not suited to most urban uses because of flooding and seasonal wetness. Severe flooding is a hazard for local roads and streets. This soil is not suited to use as sites for septic tank absorption fields because of the hazard of flooding.

This Adler soil is in capability subclass IIw.

Ak—Arkabutla silt loam, occasionally flooded. This soil is deep, nearly level, and somewhat poorly drained. It is on flood plains, and individual areas are about 10 to 150 acres. Slopes range from 0 to 2 percent.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
- 0 to 5 inches; dark yellowish brown silt loam, gray mottles

Subsoil:
- 5 to 15 inches; dark yellowish brown silt loam, gray mottles
- 15 to 45 inches; light brownish gray silt loam, mottles in shades of brown

Substratum:
- 45 to 72 inches; light gray silt loam, mottles in shades of brown

Included with this soil in mapping are a few small areas of the poorly drained Routon and Calhoun soils on low terraces. Also included are a few small areas of the poorly drained Rosebloom soils in lower pockets on the flood plain.

Important soil properties:

Permeability: moderate

Available water capacity: high
Natural fertility: medium
Soil reaction: strongly acid or very strongly acid except where lime has been added
Flood hazard: occasional, brief duration, in winter or spring
High water table: seasonal, within 1 foot to 1.5 feet of the surface
Root zone: to a depth of more than 40 inches in summer; restricted by water table in winter and early in spring

In most areas, this Arkabutla soil is used for crops, mainly soybeans, cotton, and corn. In a few areas, it is used as pasture or for hay.

This soil is well suited to most commonly grown row crops and to use as pasture. If this soil is properly managed, it can produce moderately high yields of soybeans, corn, and cotton. Some crops, particularly small grains, can be damaged by occasional flooding that generally occurs in winter or early in spring.

This soil is well suited to use as pasture. Alfalfa stands thin out prematurely because of wetness, but water-tolerant plants, such as tall fescue and white clover, can be highly productive if the soil is properly managed. The soil is too waterlogged to be used as pasture during several weeks in winter and early in spring.

This Arkabutla soil is well suited to trees. Cherrybark oak, Nuttall oak, water oak, yellow poplar, green ash, sweetgum, and American sycamore are among the adapted trees. The main limitation for managing timber is the susceptibility of this soil to compaction and rutting. Seedling mortality and plant competition are also concerns in management. Rutting and compaction are caused by using heavy equipment during wet periods. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall and using low-pressure ground equipment will damage the soil less and help to maintain productivity. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation.

This soil is not suited to most urban uses because of flooding and the seasonal high water table. Low strength is a severe limitation for local roads and streets. The soil is not suited to use as sites for septic tank absorption fields because of the hazard of flooding.

This Arkabutla soil is in capability subclass IIw.

Ar—Arkabutla silt loam, frequently flooded. This soil is deep and somewhat poorly drained. It is on flood plains, and individual areas are in elongated strips of about 40 to 500 acres. Slopes range from 0 to 2 percent.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
0 to 5 inches; dark yellowish brown silt loam, gray mottles

Subsoil:
5 to 15 inches; dark yellowish brown silt loam, gray mottles
15 to 45 inches; light brownish gray silt loam, mottles in shades of brown

Substratum:
45 to 72 inches; light gray silt loam, mottles in shades of brown

Included with this soil in mapping are a few small areas of the poorly drained Rosebloom soils and a few small areas of Routon soils.

Important soil properties:

Permeability: moderate
Available water capacity: high
Natural fertility: medium
Soil reaction: strongly acid or very strongly acid except where lime has been added
Flood hazard: frequent, generally several days duration in winter and early in spring
High water table: seasonal, within about 1.5 feet of the surface
Root zone: to a depth of more than 40 inches in summer; restricted by water table in winter and in spring

In most areas, this Arkabutla soil is used as woodland. In some areas, it has been cleared and is protected from flooding by levees. The soil in the cleared areas is used mainly to grow soybeans.

This soil is poorly suited to use as cropland. The excessive wetness and hazard of flooding are severe limitations for most row crops even with elaborate systems of drainage ditches and levees.

This soil is moderately suited to use as pasture if the plants are water-tolerant, such as tall fescue and white clover. Roots, water, and air can easily penetrate the soil late in spring or summer when the soil dries out.

This Arkabutla soil is well suited to water-tolerant trees, and it provides excellent food and cover for wildlife. Cherrybark oak, water oak, green ash, sweetgum, Nuttall oak, and eastern cottonwood are among the adapted trees. The main limitation for managing timber is the susceptibility of this soil to compaction and rutting. Plant competition and seedling mortality are also concerns in management. Rutting and compaction are caused by using heavy equipment during wet periods. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall and using low-pressure ground equipment will damage the soil less and help to maintain productivity. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation.

This soil is not suited to most urban uses because of flooding and the seasonal high water table. Low strength is a severe limitation for local roads and streets. This soil is not suited to use as sites for septic tank absorption fields because of the hazard of flooding.

This Arkabutla soil is in capability subclass IVw.

Ca—Calhoun silt loam. This soil is nearly level and poorly drained. It is on low, loess-covered stream terraces and in upland flats and depressions. Individual areas are about 5 to 75 acres. Slopes are 0 to 1 percent.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
0 to 7 inches; brown silt loam

Subsurface layer:
7 to 19 inches; light gray silt loam, mottles in shades of brown

Subsoil:
19 to 30 inches; light gray silt loam tongues between prisms of light brownish gray silt loam, mottles in shades of brown
30 to 51 inches; light brownish gray silt loam, tongues of light gray silt loam
51 to 65 inches; light brownish gray silt loam, mottles in shades of brown

Included with this soil in mapping are a few slick spots that have accumulated sodium. These spots are 0.01 to 0.25 acre each, but make up 5 percent or less of the areas in which they occur. Also included are a few areas of somewhat poorly drained Calloway and Center soils on slight rises. A few small areas of recent silt loam overwash are up to 18 inches in depth. A few low areas along drainageways are subject to occasional, brief flooding.

Important soil properties:

Permeability: slow
Available water capacity: high
Natural fertility: low
Soil reaction: strongly acid or very strongly acid to a depth of 4 feet and strongly acid to neutral below that. The surface layer is less acid where lime has been added
Flood hazard: none, except rare flooding in some areas along drainageways
Erosion hazard: slight
High water table: seasonal, perched within a depth of 0.5 foot to 1.5 feet of the surface
Root zone: to a depth of more than 40 inches in summer; restricted by water table during winter and early in spring

In most areas, this Calhoun soil is used to grow soybeans. In a few areas, it is used for cotton, corn, hay, or pasture.

This soil is only moderately suited to soybeans and other water-tolerant summer annuals because of wetness. Roots of most plants are restricted to a few inches below the surface except in summer when the water table is lower. Crops respond well to fertilizer and lime. If suitable outlets are available open ditches or tile drains can remove excess water.

This soil is well suited to hay or to use as pasture, but plant selection and good management are important. This Calhoun soil is also well suited to plants that tolerate wetness, such as tall fescue and white clover. This soil is poorly suited to deep-rooted plants that are sensitive to wetness, such as alfalfa, because germination is often inhibited and stands thin out prematurely.

This Calhoun soil is well suited to trees, including water oak, willow oak, loblolly pine, and sweetgum. The main limitation for managing timber is the susceptibility of this soil to compaction and rutting. Severe plant competition and seedling mortality are also concerns in management. Rutting and compaction are caused by using heavy equipment during wet periods. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall and using low-pressure ground equipment will damage the soil less and help to maintain productivity. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation.

This soil is poorly suited to most urban uses. Wetness, a seasonal perched water table, and slow permeability are severe limitations for most structural uses and for septic tank absorption fields. Low strength is a severe limitation for local roads and streets.

This Calhoun soil is in capability subclass IIIw.

Cb—Calloway silt loam. This soil is deep, nearly level, and somewhat poorly drained. It has a slowly permeable fragipan in the subsoil. The soil is on low uplands and stream terraces, and individual areas are about 5 to 50 acres. Slopes range from 0 to 2 percent.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
0 to 8 inches; brown silt loam

Subsoil:
8 to 17 inches; yellowish brown silt loam, mottles in shades of gray
17 to 27 inches; light brownish gray silt loam, mottles in shades of brown
27 to 55 inches; firm and brittle fragipan of yellowish brown silt loam, mottles in shades of gray and brown, gray silt coatings on prisms, and tonguing between prisms

55 to 65 inches; firm and brittle fragipan of mottled brown, gray, and yellowish brown silt loam

Included with this soil in mapping are small areas of the moderately well drained Grenada soils and a few small areas of the poorly drained Routon and Calhoun soils.

Important soil properties:

Permeability: moderate above the fragipan and slow in the fragipan
Available water capacity: moderate
Natural fertility: low
Soil reaction: medium acid to very strongly acid except where lime has been added
Flood hazard: none
Erosion hazard: slight
High water table: seasonal, perched above the fragipan at a depth of 1 foot to 2 feet
Root zone: to a depth of 2 to 2.5 feet; restricted by the fragipan

In most areas, this Calloway soil is used for crops, mainly soybeans and cotton. In a few areas, it is used for corn, wheat, hay, or pasture.

This soil is only moderately suited to row crops and small grain. Wetness in winter and early in spring and the limited available water capacity during dry periods are the main limitations. These limitations are caused by a fragipan at a depth of about 2.5 feet. Seasonal wetness inhibits rooting depth and plant germination; thus, soybeans planted late in the season or summer annuals are most productive. The limited available water capacity during dry periods also limits crop yields in most years. A conservation tillage system easily controls erosion on this nearly level soil.

This soil is well suited to adapted hay and to use as pasture, but plant selection and good management are important. This soil is suited to water-tolerant plants, such as tall fescue and white clover, but it is poorly suited to deep-rooted plants that are sensitive to wetness, such as alfalfa. Stands of alfalfa thin out after the first or second year. The perched water table causes the soil to be soggy and too soft for grazing for several weeks during the winter and early in spring. Yields are moderate to low in dry years because of the limited depth available for water storage and root development.

This Calloway soil is well suited to trees, including cherrybark oak, sweetgum, water oak, and loblolly pine. The main limitation for managing timber is the susceptibility of this soil to compaction and rutting. Plant competition is also a concern in management. Rutting and compaction are caused by using heavy equipment during wet periods. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall and using low-pressure ground equipment will damage the soil less and help to maintain productivity. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation.

This soil is poorly suited to most urban uses. Careful design and construction are necessary to overcome or minimize the seasonal wetness, slow permeability, and low strength limitations. The slow permeability and seasonal perched water table are severe limitations for septic tank absorption fields. Low strength is a severe limitation for local roads and streets.

This Calloway soil is in capability subclass IIw.

Cn—Center silt loam. This soil is deep, nearly level, and somewhat poorly drained. It is on loess-covered stream terraces and uplands, and individual areas are about 5 to 50 acres. Slopes range from 0 to 2 percent.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
0 to 9 inches; brown silt loam
Subsoil:
9 to 18 inches; yellowish brown silt loam, gray mottles
18 to 32 inches; yellowish brown silt loam, mottles in shades of gray and brown
32 to 51 inches; mottled yellowish brown, light brownish gray, and dark brown silt loam
Substratum:
51 to 72 inches; yellowish brown silt loam, mottles in shades of gray and brown

Included with this soil in mapping are a few small areas of the poorly drained Routon soils in slight depressions. Also included are a few small areas of Calloway soils on foot slopes.

Important soil properties:

Permeability: moderately slow
Available water capacity: high
Natural fertility: low
Soil reaction: strongly acid to slightly acid except the range is medium acid to neutral below a depth of about 4 feet
Flood hazard: none
Erosion hazard: slight
High water table: seasonal, within 1 foot to 2.5 feet of the surface in winter and early in spring
Root zone: to a depth of more than 40 inches in summer; restricted by water table in winter and early in spring

In most areas, this Center soil is used for crops, mainly soybeans and cotton. In a few areas, it is used for wheat, corn, hay, or pasture.

This soil is well suited to row crops. The seasonal wetness does not interfere with growing summer

annuals, and if this soil is properly managed, it can produce moderately high yields in most years. A suitable conservation tillage system can easily control erosion on this nearly level soil.

This soil is well suited to hay or to use as pasture, but plant selection and good management are important. This soil is well suited to water-tolerant plants, such as tall fescue and white clover, but it is poorly suited to deep-rooted plants that are sensitive to wetness, such as alfalfa. Stands of alfalfa thin out after the first or second year. The perched water table causes the soil to be soggy and too soft for grazing for several weeks during the winter and early in spring.

This Center soil is well suited to hardwoods, including yellow poplar, eastern cottonwood, cherrybark oak, American sycamore, and sweetgum. The main limitation for managing timber is the susceptibility of this soil to compaction and rutting. Plant competition is also a concern in management. Rutting and compaction are caused by using heavy equipment during wet periods. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall and using low-pressure ground equipment will damage the soil less and help to maintain productivity. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation.

This soil is poorly suited to most urban uses because of seasonal wetness and slow permeability. Slow permeability and a perched water table are severe limitations for septic tank absorption fields. Low strength is a severe limitation for local roads and streets.

This Center soil is in capability subclass IIw.

GrB2—Grenada silt loam, 2 to 5 percent slopes, eroded. This soil is deep, moderately well drained, and gently sloping. It has a dense, slowly permeable fragipan below a depth of about 25 inches. This soil is on ridgetops and on some side slopes, and individual areas range from 5 to 50 acres.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
- 0 to 6 inches; brown silt loam

Subsoil:
- 6 to 21 inches; yellowish brown silt loam
- 21 to 25 inches; light brownish gray silt loam, mottles in shades of brown
- 25 to 62 inches; yellowish brown silt loam fragipan, mottles in shades of gray and brown, vertical light brownish gray tongues between prisms

In most areas of this soil, most of the original surface layer has eroded away. In numerous small areas, all of the original surface layer has eroded away. In a few small areas, the soil is less eroded than is typical. A few shallow gullies are in some places. These areas are so intermingled that they cannot be mapped or managed separately.

Included with this soil in mapping are a few small areas of Calloway soils in slight depressions and on foot slopes. Also included on the somewhat higher parts of the landscape are a few small areas of Loring soils.

Important soil properties:

Permeability: moderate above the fragipan; slow in the fragipan
Available water capacity: moderate
Natural fertility: low
Soil reaction: medium acid to very strongly acid except where lime has been added
Flood hazard: none
Erosion hazard: moderate
High water table: seasonal, perched at a depth of about 2 feet
Root zone: to a depth of about 2 feet; restricted by the fragipan

In most areas, this Grenada soil is used for crops, mainly cotton and soybeans. In some areas, this soil is used for corn, wheat, hay, or pasture. Soybeans are commonly double cropped with wheat (fig. 3).

This soil is well suited to row crops and small grains if it is managed properly. The rooting depth, available water capacity, and erosion hazard are the most limiting factors. Roots are restricted to the area above the fragipan and to the grayish tongues within the fragipan. Plants respond well to fertilizer and lime, but available water limits yields in most summers. During wet periods water moves laterally in the grayish layer above the fragipan and seeps out on foot slopes as wet-weather springs. Crop rotations and conservation tillage can be used to hold erosion rates to acceptable levels.

This soil is well suited to hay or to use as pasture, but plant selection and good management are important. Plants, such as tall fescue and white clover, do not require a deep root zone and can tolerate short periods of wetness. This soil is poorly suited to deep-rooted plants that are sensitive to wetness, such as alfalfa, because stands start thinning out after the first or second year. A perched water table causes the soil to be soggy and too soft for grazing for several days at a time during winter and early in spring. Yields are moderate to low in dry years because of the limited available water.

This Grenada soil is well suited to trees, including cherrybark oak, Shumard oak, loblolly pine, and sweetgum. The main limitation for managing timber is the susceptibility to compaction and rutting. Plant competition and seedling mortality are also concerns in management. Rutting and compaction are caused by using heavy equipment during wet periods. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall and using low-pressure

Figure 3.—Soybeans are doubled cropped with wheat on Grenada silt loam, 2 to 5 percent slopes, eroded.

ground equipment will damage the soil less and help to maintain productivity. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation.

This soil is moderately suited to residential, commercial, and industrial development if central sewage service is available. This soil has severe limitations as sites for septic tank absorption fields because of the slow permeability in the fragipan and a seasonal perched water table. Low strength is a severe limitation for local roads and streets. The seasonal wetness is a moderate limitation for dwellings without basements and for lawns.

This Grenada soil is in capability subclass IIe.

GrB3—Grenada silt loam, 2 to 5 percent slopes, severely eroded. This soil is deep, moderately well drained, and gently sloping. It has a dense, slowly permeable fragipan at a depth of about 18 inches. This soil is on ridgetops and on some hillsides, and individual areas range from 5 to 50 acres.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
0 to 5 inches; yellowish brown silt loam
Subsoil:
5 to 14 inches; yellowish brown silt loam, pale brown mottles in lower part
14 to 18 inches; light brownish gray silt loam, mottles in shades of brown
18 to 62 inches; firm and brittle fragipan of yellowish brown silt loam, mottles in shades of gray and brown, vertical light brownish gray tongues between prisms

In most areas of this soil, all of the original surface layer and part of the subsoil has eroded away. In numerous small areas, most of the subsoil above the fragipan has eroded away. In other small areas, the soil is less eroded than is typical. Shallow gullies and a few deep gullies are in some places. These areas are so

intermingled that they can not be mapped or managed separately.

Included with this soil in mapping are narrow areas of Adler soils along drainageways. Also included are small areas of the somewhat poorly drained Calloway soils in slight depressions and on foot slopes.

Important soil properties:

Permeability: moderate above the fragipan; slow in the fragipan
Available water capacity: moderate
Natural fertility: low
Soil reaction: medium acid to very strongly acid except where lime has been added
Flood hazard: none
Erosion hazard: moderate
High water table: seasonal, perched at a depth of about 1.5 feet
Root zone: to a depth of 1.5 feet; restricted by the fragipan

In most areas, this Grenada soil is used for crops, mainly cotton and soybeans. In some areas, the soil is used for corn, wheat, hay, or pasture.

This soil is only moderately suited to row crops and small grains because of the effects of past erosion and the hazard of additional erosion. The rooting depth, available water capacity, and the hazard of erosion are the most limiting factors. Roots are restricted to the area above the fragipan and to the grayish tongues within the fragipan. Crops respond well to fertilizer and lime, but available water capacity of the soil restricts yields in most years. During wet periods, water moves laterally above the fragipan and seeps out on foot slopes as wet-weather springs. Crop rotation and conservation tillage can be used to hold erosion rates to acceptable levels. The tillage system should include contour farming, sod planting, and stubble mulching to help control runoff and increase water storage.

This soil is well suited to hay and to use as pasture, but plant selection and good management are important. Plants, such as tall fescue and white clover, do not require a deep root zone and can tolerate short periods of wetness. This soil is poorly suited to deep-rooted plants that are sensitive to wetness, such as alfalfa, because stands start thinning out after the first or second year. A perched water table causes the soil to be soggy and too soft for grazing for several days at a time during the winter and early in spring. Yields are moderate or low in dry years because of the limited available water.

This Grenada soil is well suited to trees, including cherrybark oak, Shumard oak, loblolly pine, and sweetgum. The main limitation for managing timber is the susceptibility of this soil to compaction and rutting. Plant competition and seedling mortality are also concerns in management. Rutting and compaction are caused by using heavy equipment during wet periods. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall and using low-pressure ground equipment will damage the soil less and help to maintain productivity. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation.

This soil is moderately suited to residential, commercial, and industrial development if central sewage service is available. The soil has severe limitations for septic tank absorption fields because of the slow permeability in the fragipan and a seasonal perched water table. Low strength is a severe limitation for local roads and streets. The seasonal wetness is a moderate limitation for dwellings without basements and for lawns.

This Grenada soil is in capability subclass IIIe.

GrC3—Grenada silt loam, 5 to 8 percent slopes, severely eroded. This soil is deep, moderately well drained, and sloping. It is on hillsides. It has a dense, slowly permeable fragipan at a depth of about 18 inches. Individual areas range from 5 to 50 acres.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
0 to 5 inches; yellowish brown silt loam
Subsoil:
5 to 14 inches; yellowish brown silt loam, pale brown mottles or skeletans in the lower part
14 to 18 inches; light brownish gray silt loam, mottles in shades of brown
18 to 62 inches; firm and brittle fragipan of light brownish gray silt loam, mottles in shades of brown, vertical light brownish gray tongues between prisms

In most areas of this soil, all of the original surface layer and part of the subsoil has eroded away. In numerous small areas, most of the subsoil above the fragipan has eroded away. In other small areas, the soil is less eroded than is typical. These areas are so intermingled that they can not be mapped or managed separately. Shallow gullies and a few deep gullies are in some places. Many small gullies are filled during spring seedbed preparation each year, but they form again by the next spring.

Included with this soil in mapping are narrow areas of Adler soils along drainageways. Also included are small areas of the somewhat poorly drained Calloway soils on foot slopes and in depressions. Small areas of Loring soils are on slightly convex, higher ridges.

Important soil properties:

Permeability: moderate above the fragipan; slow in the fragipan
Available water capacity: low

Natural fertility: low
Soil reaction: medium acid to very strongly acid except where lime has been added
Flood hazard: none
Erosion hazard: severe
High water table: seasonal, perched at a depth of about 1.5 feet
Root zone: to a depth of about 1.5 feet; restricted by the fragipan

In most areas, this Grenada soil is used for crops, mainly cotton and soybeans. In some areas, the soil is used as pasture.

This soil is poorly suited to row crops and small grains because of the effects of past erosion and the hazard of additional erosion. Rooting depth, available water capacity, and the erosion hazard are the most limiting factors. Roots are restricted to the area above the fragipan and to the grayish tongues within the fragipan. Plants respond to fertilizer and lime, but the limited available water capacity of the soil restricts yields in most summers. During wet periods, water moves laterally in the grayish layer above the fragipan, and seeps out on foot slopes as wet-weather springs. Maintaining permanent vegetation is the most effective way to protect this soil from further erosion. Erosion can be held to an acceptable level if row crops are grown in rotation with sod crops and a conservation tillage system is used that includes contour farming, sod planting, and stubble mulching. Conservation tillage also increases water infiltration.

This soil is well suited to hay and to use as pasture if plants are selected carefully. Tall fescue, ladino clover, sericea lespedeza, and bermudagrass are some of the most productive plants. Fertilizer and lime, applied according to soil tests, are important to maintain yields and good plant cover.

This Grenada soil is well suited to trees, including cherrybark oak, Shumard oak, loblolly pine, and sweetgum. The main limitation for managing timber is the susceptibility of this soil to compaction, rutting, and erosion. Plant competition is also a concern in management. Rutting and compaction are caused by using heavy equipment during wet periods. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall, and using low-pressure ground equipment will damage the soil less and help to maintain productivity. Erosion can be controlled by maintaining plant cover, locating roads and logging trails on the contour, and avoiding use of heavy equipment during wet periods. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation.

This soil is moderately suited to residential, commercial, or industrial development if central sewage service is available. The soil has severe limitations for septic tank absorption fields because of the slow permeability in the fragipan and a seasonal perched water table. Low strength is a severe limitation for local roads and streets. The seasonal wetness is a moderate limitation for dwellings without basements and for lawns.

This Grenada soil is in capability subclass IVe.

LeB3—Lexington silt loam, 2 to 5 percent slopes, severely eroded. This soil is deep, gently sloping, and well drained. It is on narrow ridgetops in the hilly uplands. Individual areas are 5 to 40 acres.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
0 to 7 inches; dark brown silt loam
Subsoil:
7 to 32 inches; dark brown silty clay loam and silt loam
32 to 44 inches; dark brown clay loam
44 to 53 inches; reddish brown sandy loam
53 to 72 inches; pale brown loamy sand, alternating bands of reddish brown sandy loam

In most areas of this soil, all of the original surface layer and part of the subsoil has eroded away. The soil is somewhat less eroded in a few small areas. A few shallow gullies are in some places.

Included with this soil in mapping are a few small areas of the moderately well drained Loring soils and a few small areas of the loamy Smithdale soils.

Important soil properties:

Permeability: moderate in the upper part; moderately rapid below a depth of about 44 inches
Available water capacity: high
Natural fertility: low
Soil reaction: medium acid to very strongly acid except where lime has been added
Flood hazard: none
Erosion hazard: moderate
High water table: none within 6 feet of the surface
Root zone: to a depth of more than 40 inches

In most areas, this Lexington soil is used for crops, mainly cotton, corn, and soybeans. In some areas, it is used for wheat, hay, or pasture.

If managed properly, this soil is highly productive and is well suited to all locally adapted crops. Alfalfa grows well and produces good yields where adequate liming, fertilizing, and other management needs are carried out. A suitable conservation tillage system is needed to prevent damage from further erosion. Sod planting, stubble planting, contour cultivation, and stripcropping can hold erosion to an acceptable level and help to maintain productivity.

This soil is well suited to hay and to use as pasture. It is suited to all locally adapted plants; alfalfa,

orchardgrass, and other high-quality forages respond well to management. This soil has no significant limitations for forage production if erosion is controlled.

This Lexington soil is well suited to trees, including cherrybark oak, southern red oak, yellow poplar, sweetgum, and loblolly pine. The main limitation for managing timber is the susceptibility of this soil to compaction and rutting. Plant competition is also a concern in management. Rutting and compaction is caused by use of heavy equipment during wet periods. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall and using low-pressure ground equipment will damage the soil less and help to maintain productivity. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation.

This soil is well suited to most urban uses. Low strength is a severe limitation for local roads and streets. The moderate permeability is a moderate limitation for septic tank absorption fields. These limitations can be overcome or offset by proper design and construction.

This Lexington soil is in capability subclass IIIe.

LeC3—Lexington silt loam, 5 to 8 percent slopes, severely eroded. This soil is deep, sloping, and well drained. It is on narrow ridgetops and side slopes on the hilly uplands. Individual areas are about 5 to 30 acres.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
0 to 6 inches; dark brown silt loam
Subsoil:
6 to 30 inches; dark brown silt loam
30 to 40 inches; dark brown clay loam
40 to 52 inches; reddish brown sandy clay loam and clay loam
52 to 72 inches; pale brown loamy sand, alternating bands of reddish brown sandy loam

In most areas of this soil, all of the original surface layer and part of the subsoil has eroded away. The soil is somewhat less eroded in a few small areas. A few deep gullies are in some places. Shallow gullies form during and after each cropping season on some cultivated fields. These gullies are generally filled in with soil material from adjacent areas before seedbed preparation each spring. Removing a layer of soil to fill in gullies reduces the productivity of the soil in the adjacent areas.

Included with this soil in mapping are a few small areas of the moderately well drained Loring soils and a few areas of the loamy Smithdale soils.

Important soil properties:

Permeability: moderate in the upper part; moderately rapid below a depth of about 40 inches
Available water capacity: high or moderate
Natural fertility: low
Soil reaction: medium acid to very strongly acid except where lime has been added
Flood hazard: none
Erosion hazard: severe
High water table: none within 6 feet of the surface
Root zone: to a depth of more than 40 inches

In most areas, this Lexington soil is used for crops, mainly cotton and soybeans. In some areas, the soil is used for corn, pasture, or hay.

This soil is moderately suited to row crops if conservation tillage is used to control erosion. The soil responds well to fertilizer and lime. If this Lexington soil is properly managed, it can produce moderately high yields of all commonly grown crops. Erosion is a hazard to row crops. Protective plant cover, contour cultivation, stubble planting, and other conservation measures are needed to prevent additional erosion.

This soil is well suited to hay and to use as pasture. If this soil is properly managed, it can produce high yields of tall fescue, white clover, alfalfa, and sericea lespedeza. Adequate lime and fertilizer are necessary for maximum yields.

This Lexington soil is well suited to trees, including cherrybark oak, southern red oak, yellow poplar, loblolly pine, and sweetgum. The main limitation for managing timber is the susceptibility of this soil to compaction, rutting, and erosion. Plant competition is also a concern in management. Rutting and compaction is caused by using heavy equipment during wet periods. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall and using low-pressure ground equipment will damage the soil less and help to maintain productivity. Erosion can be controlled by maintaining plant cover, locating roads and logging trails on the contour, and avoiding the use of heavy equipment during wet periods. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation.

This soil is well suited to residential uses. The moderate permeability is a moderate limitation for septic tank absorption fields. Low strength is a severe limitation for local roads and streets. Proper design and construction can minimize the permeability and low strength limitations.

This Lexington soil is in capability subclass IVe.

LeD3—Lexington silt loam, 8 to 12 percent slopes, severely eroded. This soil is strongly sloping, deep, and well drained. It is on hillsides, and individual areas are about 5 to 50 acres.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
0 to 6 inches; dark brown silt loam

Subsoil:
6 to 30 inches; dark brown silt loam
30 to 40 inches; dark brown clay loam
40 to 52 inches; reddish brown sandy loam
52 to 72 inches; pale brown loamy sand, alternating bands of reddish brown sandy loam

In most areas of this soil, all of the original surface layer and part of the subsoil has eroded away. In a few small areas, the soil is somewhat less eroded. Large gullies have formed at intervals of 200 to 300 feet in some areas. Smaller gullies are at closer intervals in some areas.

Included with this soil in mapping are a few small areas of the loamy Smithdale soils and a few small areas of the moderately well drained Loring soils.

Important soil properties:

Permeability: moderate in the upper part; moderately rapid below a depth of about 40 inches
Available water capacity: high or moderate
Natural fertility: low
Soil reaction: medium acid to very strongly acid except where lime has been added
Flood hazard: none
Erosion hazard: severe
High water table: none within 6 feet of the surface
Root zone: to a depth of more than 40 inches

In most areas, this Lexington soil is used for cotton, soybeans, or pasture. In a few areas, it is idle and gradually reverting to hardwoods.

This soil is generally not suited to use as cropland because of the steepness of slope and the susceptibility to further erosion. Permanent plant cover is needed to help control erosion. If row crops must be grown on this soil, a conservation tillage system that includes contour farming is needed to minimize erosion damage. If this Lexington soil is properly managed, it can produce moderate yields of all commonly grown crops. The moisture available for crops during dry periods depends upon the infiltration of rainfall from previous rains and the rate of runoff.

This soil is well suited to hay and to use as pasture. Tall fescue, white clover, alfalfa, and sericea lespedeza are suitable plants. If this Lexington soil is well managed, it can produce moderate forage yields. Management includes adequate applications of lime and fertilizer

This Lexington soil is well suited to trees, including cherrybark oak, southern red oak, yellow poplar, loblolly pine, and sweetgum. The main limitation for managing timber is the susceptibility of this soil to compaction, rutting, and erosion. Plant competition is also a concern in management. Rutting and compaction are caused by using heavy equipment during wet periods. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall and using low-pressure ground equipment will damage the soil less and help to maintain productivity. Erosion can be controlled by maintaining plant cover, locating roads and logging trails on the contour, and avoiding the use of heavy equipment during wet periods. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation.

This soil is moderately suited to residential uses. The strong slopes and moderate permeability are moderate limitations for septic tank absorption fields. The strong slopes are severe limitations for commercial and industrial developments. Low strength is a severe limitation for local roads and streets. Proper design and construction can minimize the slope, permeability, and low strength limitations.

This Lexington soil is in capability subclass VIe.

LoB2—Loring silt loam, 2 to 5 percent slopes, eroded. This soil is deep, gently sloping, and moderately well drained. It has a dense fragipan in the subsoil. This soil is on ridgetops on the uplands, and individual areas are about 10 to 100 acres.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
0 to 7 inches; brown silt loam

Subsoil:
7 to 21 inches; dark yellowish brown silty clay loam
21 to 30 inches; dark yellowish brown silt loam, mottles in shades of brown
30 to 65 inches; dense fragipan of dark brown silt loam, mottles in shades of brown and gray

In most areas of this soil, almost all of the original plow layer has eroded away. In a few small areas, the soil is less eroded.

Included with this soil in mapping are a few small areas of well drained Memphis soils on higher convex knolls and a few small areas of Grenada soils on saddles.

Important soil properties:

Permeability: moderate in the upper part; slow in the fragipan
Available water capacity: high
Natural fertility: low
Soil reaction: strongly acid to medium acid except where lime has been added
Flood hazard: none
Erosion hazard: moderate
High water table: seasonal, perched at a depth of 2 to 2.5 feet in winter and early in spring
Root zone: to a depth of 2 to 2.5 feet; restricted by the fragipan

In most areas, this Loring soil is used for cotton and soybeans. In a few areas, it is used for corn, wheat, or pasture.

This soil is well suited to most of the locally grown crops if conservation tillage is used to prevent further erosion damage. If this soil is properly managed it can produce high yields.

This soil is well suited to hay and to use as pasture. Most locally adapted plants grow well, but alfalfa and other moisture-sensitive perennials can be short-lived. Adequate lime and fertilizer are essential for optimum production.

This Loring soil is well suited to trees, including cherrybark oak, southern red oak, yellow poplar, sweetgum, and loblolly pine. The main limitation for managing timber is the susceptibility of this soil to compaction and rutting. Plant competition is also a concern in management. Rutting and compaction are caused by using heavy equipment during wet periods. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall and using low-pressure ground equipment will damage the soil less and help to maintain productivity. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation.

This soil is moderately suited to most urban uses. Seasonal wetness and slow permeability are severe limitations for septic tank absorption fields. Low strength is a severe limitation for local roads and streets.

This Loring soil is in capability subclass IIe.

LoB3—Loring silt loam, 2 to 5 percent slopes, severely eroded. This soil is deep, moderately well drained, and gently sloping. It has a dense fragipan layer in the subsoil. The soil is on ridgetops and gentle side slopes on the uplands. Individual areas are about 5 to 50 acres.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
0 to 6 inches; dark yellowish brown silt loam

Subsoil:
6 to 20 inches; dark yellowish brown silt loam
20 to 65 inches; dense fragipan of dark brown silt loam, mottles and coatings on prisms in shades of brown and gray

In most areas of this soil, all of the original surface layer and part of the subsoil eroded away. In a few small areas, the soil is somewhat less eroded. Small gullies form in some areas during and after each cropping season. These gullies are generally filled in with soil material from adjacent areas before seedbed preparation each spring. Removing a layer of soil to fill in gullies reduces the productivity of the soil in the adjacent areas.

Included with this soil in mapping are Grenada soils in a few small concave areas around the heads of drainageways. Also included are a few small areas of Memphis soils on high knolls.

Important soil properties:

Permeability: moderate in the upper part; slow in the fragipan
Available water capacity: moderate
Natural fertility: low
Soil reaction: strongly acid or medium acid except where lime has been added
Flood hazard: none
Erosion hazard: moderate
High water table: seasonal, perched at a depth of 1.5 to 2 feet
Root zone: to a depth of 1.5 to 2 feet; restricted by the fragipan

In most areas, this Loring soil is used for cotton and soybeans. In a few areas, it is used for corn, wheat, or pasture.

This soil is moderately suited to most of the commonly grown crops if a conservation tillage system is used to control runoff and minimize further erosion (fig. 4). Corn is damaged by a moisture deficit in some years. A conservation tillage system can help minimize the moisture deficit limitation by increasing water infiltration and by providing the protection of mulch on the surface.

This soil is well suited to hay and to use as pasture if plants are selected carefully. Tall fescue, white clover, and sericea lespedeza are among plants that grow well on this soil. Alfalfa and other deep-rooted, moisture-sensitive plants tend to thin out after the first or second year. If this soil is properly managed, it can produce acceptable forage yields. Management practices include adequate weed control and applications of lime and fertilizer.

This Loring soil is well suited to trees, including cherrybark oak, southern red oak, yellow poplar, sweetgum, and loblolly pine. The main limitation for managing timber is the susceptibility of this soil to compaction and rutting. Plant competition is also a concern in management. Rutting and compaction are caused by using heavy equipment. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall and using low-pressure ground equipment will damage the soil less and help to maintain productivity. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation.

This soil is moderately suited to most urban uses. It is severely limited for use as sites for septic tank absorption fields because of the seasonal wetness and slow permeability. Low strength is a severe limitation for local roads and streets.

This Loring soil is in capability subclass IIIe.

Figure 4.—Seeding soybeans in stubble in this area of Loring silt loam, 2 to 5 percent slopes, severely eroded, conserves moisture and reduces runoff and erosion.

LoC3—Loring silt loam, 5 to 8 percent slopes, severely eroded. This soil is deep, moderately well drained, and moderately sloping. It has a dense fragipan in the lower part of the subsoil. The soil is on hillsides, and individual areas are about 5 to 50 acres.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
0 to 6 inches; dark yellowish brown silt loam

Subsoil:
6 to 20 inches; dark yellowish brown silt loam
20 to 65 inches; dense fragipan of dark brown silt loam, mottles and prism coatings in shades of gray

In most areas of this soil, the original surface layer and part of the subsoil has eroded away. In a few small areas, the soil is less eroded. A few large gullies are in some areas. Small gullies form in cultivated areas during and after the cropping season. These gullies are generally filled in with soil material from adjacent areas before seedbed preparation each spring. Removing a layer of soil to fill in gullies reduces the productivity of the soil in the adjacent areas.

Included with this soil in mapping are a few small areas of Grenada soils near drainageways. Also included are a few areas that have loamy or sandy soil material below a depth of about 44 inches.

Important soil properties:

Permeability: moderate in the upper part; slow in the fragipan
Available water capacity: moderate or low
Natural fertility: low
Soil reaction: strongly acid or medium acid except where lime has been added
Flood hazard: none

Erosion hazard: severe
High water table: seasonal, perched at a depth of 1.5 to 2 feet
Root zone: to a depth of about 1.5 to 2 feet; restricted by the fragipan

In many areas, this Loring soil is used for soybeans and cotton. In some areas, it is used for wheat, pasture, or hay.

This soil is poorly suited to row crops because of the hazard of additional erosion damage and because of the limited rooting depth and available water capacity. If a conservation tillage system is used to prevent erosion and increase water infiltration, this soil will produce acceptable yields of soybeans, milo, and other hardy summer annuals. Late-summer drought can cause a reduction in yields of corn and other crops that require large amounts of water.

This soil is well suited to hay and to use as pasture, but permanent plant cover is needed on this soil to prevent additional erosion damage. Most locally adapted plants grow well, but deep-rooted, moisture-sensitive plants, such as alfalfa, tend to thin out after the first or second year. This soil is well suited to tall fescue, white clover, and sericea lespedeza. If adequate lime and fertilizer are used, this soil can produce high yields.

This Loring soil is well suited to trees, including cherrybark oak, southern red oak, yellow poplar, loblolly pine, and sweetgum. The main limitation in managing timber is the susceptibility of this soil to compaction, rutting, and erosion. Plant competition is also a concern in management. Rutting and compaction are caused by using heavy equipment during wet periods. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall and using low-pressure ground equipment will damage the soil less and help to maintain productivity. Erosion can be controlled by maintaining plant cover, locating roads and logging trails on the contour, and avoiding the use of heavy equipment during wet periods. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation.

This soil is moderately suited to most urban uses. It is severely limited to use as sites for septic tank absorption fields because of the seasonal wetness and slow permeability. Low strength is a severe limitation for local roads and streets.

This Loring soil is in capability subclass IVe.

LoD3—Loring silt loam, 8 to 12 percent slopes, severely eroded. This soil is strongly sloping, deep, and moderately well drained. It has a fragipan in the subsoil. The soil is on hillsides, and individual areas are about 5 to 75 acres.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
0 to 5 inches; dark yellowish brown silt loam
Subsoil:
5 to 17 inches; dark yellowish brown silt loam
17 to 62 inches; dense fragipan of dark yellowish brown silt loam, mottles in shades of brown and gray

In most areas of this soil, the original surface layer and part of the subsoil has eroded away. In a few small areas, the soil is less eroded. A few large gullies are in some areas. Some smaller gullies form in cultivated areas during and after the cropping season. These gullies are generally filled in with soil material from adjacent areas before seedbed preparation each spring. Removing a layer of soil to fill in gullies reduces the productivity of the soil in the adjacent areas.

Included with this soil in mapping are a few small areas of Grenada soils near drainageways. Also included are a few areas that have sandy or loamy soil material below a depth of about 40 inches.

Important soil properties:

Permeability: moderate in the upper part; slow in the fragipan
Available water capacity: low
Natural fertility: low
Soil reaction: strongly acid or medium acid except where lime has been added
Flood hazard: none
Erosion hazard: very severe
High water table: seasonal, perched at a depth of 1.5 to 2 feet
Root zone: to a depth of 1 foot to 1.5 feet; restricted by the fragipan

In most areas, this Loring soil is used for cotton, soybeans, hay, or pasture.

This soil is not suited to use as cropland because of the strong slopes, the very severe erosion hazard, and the low available water capacity. Yields are low because this soil is drouthy. This soil is subject to erosion if the soil is cultivated or if the surface is not protected by vegetation. A conservation tillage system can help minimize erosion if row crops are grown. Lime and fertilizer are needed, but much fertility is lost as the surface layer erodes.

This soil is well suited to hay and to use as pasture. Permanent plant cover is needed to prevent further damage from erosion. Careful selection of sod crops is important. The soil is well suited to hardy plants, such as tall fescue, white clover, sericea lespedeza, and bermudagrass. Less hardy plants, such as orchardgrass and alfalfa, are likely to be short-lived. If this soil is managed properly, perennials can be fairly productive. Fertilizer and lime, applied according to soil test recommendations, are important to sustain adequate yields.

This Loring soil is well suited to trees, including cherrybark oak, southern red oak, yellow poplar, loblolly pine, and sweetgum. The main limitation for managing timber is the susceptibility of this soil to compaction, rutting, and erosion. Plant competition is also a concern in management. Rutting and compaction are caused by using heavy equipment during wet periods. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall and using low-pressure ground equipment will damage the soil less and help to maintain productivity. Erosion can be controlled by maintaining plant cover, locating roads and logging trails on the contour, and avoiding use of heavy equipment during wet periods. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation.

This soil is moderately suited to most urban uses if central sewage service is available. Proper design and construction are needed to overcome problems caused by the strong slopes, high erodibility, and seasonal wetness. Low strength is a severe limitation for local roads and streets. This soil has severe limitations for septic tank absorption fields because of wetness and slow permeability.

This Loring soil is in capability subclass VIe.

LoE3—Loring silt loam, 12 to 20 percent slopes, severely eroded. This soil is deep, moderately well drained, and moderately steep. It has a dense fragipan in the subsoil. The soil is on hillsides, and individual areas are about 5 to 75 acres.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
- 0 to 5 inches; dark yellowish brown silt loam

Subsoil:
- 5 to 17 inches; dark yellowish brown silt loam
- 17 to 62 inches; dense fragipan of dark brown silt loam, mottles and prism coatings in shades of gray

In most areas of this soil, all of the original surface layer and part of the subsoil eroded away. In a few areas, the soil is somewhat less eroded than is typical. A few gullies are in most areas.

Included with this soil in mapping are a few small areas of the well drained Smithdale soils and a few areas of a soil similar to the Loring soil, except it has loamy or sandy material in the lower part of the fragipan at a depth of about 40 inches.

Important soil properties:

Permeability: moderate in the upper part; slow in the fragipan
Available water capacity: low
Natural fertility: low
Soil reaction: strongly acid or medium acid except where lime has been added
Flood hazard: none
Erosion hazard: very severe
High water table: seasonal, perched at a depth of 1.5 to 2 feet
Root zone: to a depth of 1 foot to 1.5 feet; restricted by the fragipan

In most areas, this Loring soil is used as pasture. In a few areas, it is used as woodland or for hay and row crops.

This soil is not suited to row crops because of the very severe hazard of erosion and the shallow depth to the fragipan. The soil is drouthy because of a high rate of runoff and a shallow root zone. Crop yields generally are low.

This soil is moderately suited to hay and to use as pasture. Permanent plant cover is needed to prevent more damage from erosion (fig. 5). If this soil is properly managed, it will produce moderate yields of adapted forage plants. The soil is better suited to drouth-resistant, hardy plants, such as tall fescue and sericea lespedeza, than to alfalfa, which tends to thin out after the first or second year.

This Loring soil is well suited to trees, including cherrybark oak, southern red oak, yellow poplar, loblolly pine, and sweetgum. The main limitation in managing timber is the susceptibility of this soil to compaction, rutting, and severe erosion. Plant competition is also a concern in management. Rutting and compaction are caused by using heavy equipment during wet periods. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall and using low-pressure ground equipment will damage the soil less and help to maintain productivity. Erosion can be controlled by maintaining plant cover, locating roads and logging trails on the contour, and avoiding use of heavy equipment during wet periods. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation.

This soil is poorly suited to most urban uses because of the moderately steep slopes and slow permeability. It is subject to severe erosion and a high rate of runoff. Low strength is a severe limitation for local roads and streets. The seasonal wetness, slow permeability, and steep slopes are severe limitations for septic tank absorption fields.

This Loring soil is in capability subclass VIIe.

MeB2—Memphis silt loam, 2 to 5 percent slopes, eroded. This soil is deep, well drained, and gently sloping. It is mostly on narrow ridgetops, and individual areas are about 5 to 40 acres.

The typical sequence, depth, and composition of the layers of this soil are—

Figure 5.—Erosion is effectively controlled in this moderately steep area of Loring silt loam, 12 to 20 percent slopes, severely eroded, in the background.

Surface layer:
0 to 6 inches; brown silt loam
Subsoil:
6 to 21 inches; dark brown silty clay loam
21 to 61 inches; dark brown silt loam
Substratum:
61 to 72 inches; dark brown silt loam

In most areas of this soil, almost all of the original surface layer has eroded away. In a few small areas, the soil is somewhat less eroded, but in other places, the subsoil has become the plow layer.

Included with this soil in mapping are a few small areas of the moderately well drained Loring soils and a few areas of the Lexington soils.

Important soil properties:

Permeability: moderate
Available water capacity: high
Natural fertility: low
Soil reaction: medium acid to very strongly acid except where lime has been added
Flood hazard: none
Erosion hazard: moderate
High water table: none within 6 feet of the surface
Root zone: to a depth of more than 40 inches

In most areas, this Memphis soil is used for row crops, mostly cotton and soybeans. In a few areas, it is used as pasture or for hay.

This soil is well suited to use as cropland. It is highly erodible when cultivated, and a conservation tillage system is needed to prevent further damage from erosion. Contour farming, conservation tillage, and

stubble planting are some of the conservation measures that are effective in increasing water infiltration and keeping erosion rates at an acceptable level. The soil is highly productive if it is properly managed. Lime and fertilizer, applied according to soil test recommendations, are needed for sustained yields.

This soil is well suited to hay and to use as pasture. Permanent plant cover helps keep erosion to a minimum. All locally grown forage plants grow well on this soil if the soil is properly managed. Alfalfa grows well, and if seeded with grass, can help control erosion. Lime and fertilizer, applied according to soil test recommendations, are needed for optimum yields.

This Memphis soil is well suited to trees, including cherrybark oak, yellow poplar, black walnut, southern red oak, loblolly pine, and sweetgum. The main limitation in managing timber is the susceptibility of this soil to compaction and rutting. Plant competition is also a concern in management. Rutting and compaction are caused by using heavy equipment during wet periods. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall and using low-pressure ground equipment will damage the soil less and help to maintain productivity. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation.

This soil is well suited to most urban uses. Permeability is a moderate limitation for septic tank absorption fields. Low strength is a severe limitation for local roads and streets.

This Memphis soil is in capability subclass IIe.

MeC3—Memphis silt loam, 5 to 8 percent slopes, severely eroded. This soil is deep, well drained, and moderately sloping. It is on narrow ridgetops and hillsides, and individual areas are about 5 to 40 acres.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
0 to 6 inches; brown silt loam
Subsoil:
6 to 15 inches; dark brown silty clay loam
15 to 65 inches; dark brown silt loam

In most areas of this soil, the original surface layer has eroded away. A few gullies are in some places. In a few places, the soil is somewhat less severely eroded than is typical.

Included with this soil in mapping are a few small areas of the moderately well drained Loring soils and well drained Lexington soils.

Important soil properties:

Permeability: moderate
Available water capacity: high
Natural fertility: low
Soil reaction: medium acid to very strongly acid except where lime has been added
Flood hazard: none
Erosion hazard: severe
High water table: none within 6 feet of the surface
Root zone: to a depth of more than 40 inches

In most areas, this Memphis soil is used for row crops, mostly cotton and soybeans. In a few areas, it is used as pasture or for hay.

This soil is only moderately suited to use as cropland. It is highly erodible, and a conservation tillage system is needed to prevent further damage from erosion. Contour farming, conservation tillage, and stubble planting are some of the conservation measures that are effective in increasing water infiltration and keeping erosion rates to an acceptable level. The soil is productive if it is properly managed. Lime and fertilizer, applied according to soil test recommendations, are needed for sustained yields.

This soil is well suited to hay and to use as pasture. Permanent plant cover helps keep erosion to a minimum. All locally grown forage plants grow well if this soil is properly managed. Alfalfa grows well, and if seeded with grass, can help control erosion. Lime and fertilizer, applied according to soil test recommendations, are needed for optimum yields.

This Memphis soil is well suited to trees, including cherrybark oak, southern red oak, yellow poplar, loblolly pine, and sweetgum. The main limitation for managing timber is the susceptibility of this soil to compaction, rutting, and erosion. Plant competition is also a concern in management. Rutting and compaction are caused by using heavy equipment during wet periods. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall and using low-pressure ground equipment will damage the soil less and help to maintain productivity. Erosion can be controlled by maintaining plant cover, locating roads and logging trails on the contour, and avoiding use of heavy equipment during wet periods. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation.

This soil is well suited to most urban uses. Permeability is a moderate limitation for septic tank absorption fields. Low strength is a severe limitation for local roads and streets.

This Memphis soil is in capability subclass IVe.

MeD3—Memphis silt loam, 8 to 12 percent slopes, severely eroded. This soil is deep, well drained, and strongly sloping. It is on hillsides, and individual areas are about 5 to 40 acres.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
0 to 6 inches, dark brown silt loam

Subsoil:
6 to 15 inches; dark brown silty clay loam
15 to 65 inches; dark brown silt loam

In most areas of this soil, the original surface layer and part of the subsoil eroded away. In a few small areas, the soil is not so severely eroded. A few large gullies are in several areas. Some smaller gullies form each year in cultivated areas. These gullies generally are filled in with soil material from adjacent areas before seedbed preparation each spring. Removing a layer of soil to fill in gullies reduces the productivity of the soil in the adjacent areas.

Included with this soil in mapping are a few small areas of the moderately well drained Loring soils and a few areas of the well drained Lexington and Smithdale soils.

Important soil properties:

Permeability: moderate
Available water capacity: high
Natural fertility: low
Soil reaction: medium acid to very strongly acid except where lime has been added
Flood hazard: none
Erosion hazard: very severe
High water table: none within 6 feet of the surface
Root zone: to a depth of more than 40 inches

In most areas, this Memphis soil is used for row crops, mainly cotton and soybeans. In a few areas, it is used for hay or pasture.

This soil generally is not suited to use as cropland. It is subject to very severe erosion when cultivated. If row crops are grown, special measures are needed to prevent high rates of erosion.

This soil is well suited to hay and to use as pasture; however, permanent plant cover is needed to keep erosion to a minimum. All locally grown forage plants grow well if this soil is properly managed. Alfalfa grows well, and if seeded with grass, can help control erosion. Lime and fertilizer, applied according to soil test recommendations, are needed for optimum yields.

This Memphis soil is well suited to trees, including cherrybark oak, southern red oak, yellow poplar, loblolly pine, and sweetgum. The main limitation for managing timber is the susceptibility of this soil to compaction, rutting, and erosion. Plant competition is also a concern in management. Rutting and compaction are caused by using heavy equipment during wet periods. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall and using low-pressure ground equipment will damage the soil less and help to maintain productivity. Erosion can be controlled by maintaining plant cover, locating roads and logging trails on the contour, and avoiding use of heavy equipment during wet periods. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation.

This soil has moderate or severe limitations for most urban uses. The moderately steep slope is a moderate limitation for dwellings and small commercial buildings. The moderate permeability and the moderately steep slope are moderate limitations for septic tank absorption fields. Low strength is a severe limitation for local roads and streets.

This Memphis soil is in capability subclass VIe.

MeE3—Memphis silt loam, 12 to 20 percent slopes, severely eroded. This soil is deep, well drained, and moderately steep. It is on hillsides, and individual areas are about 5 to 50 acres.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
0 to 6 inches; dark brown silt loam
Subsoil:
6 to 15 inches; dark brown silty clay loam
15 to 65 inches; dark brown silt loam

In most areas of this soil, all of the original surface layer and part of the subsoil has eroded away. In a few small areas, the soil is somewhat less eroded. A few gullies are in many areas.

Included with this soil in mapping are a few small areas of Lexington and Smithdale soils and a few small areas of the moderately well drained Loring soils.

Important soil properties:

Permeability: moderate
Available water capacity: high
Natural fertility: low
Soil reaction: medium acid to very strongly acid except where lime has been added
Flood hazard: none
Erosion hazard: very severe
High water table: none within 6 feet of the surface
Root zone: to a depth of more than 40 inches

In most areas, this Memphis soil is used for cotton, soybeans, and pasture. In a few areas, it is idle and is gradually reverting to hardwoods.

This soil is not suited to use as cropland because of the moderately steep slopes and a very high rate of erosion where row crops are grown. Sod crops are needed to control erosion.

This soil is well suited to hay and to use as pasture. Tall fescue, white clover, alfalfa, and sericea lespedeza grow well. If this soil is properly managed, it can produce moderate yields. Management practices include adequate lime and fertilizer applications. The moisture available for crops during dry periods depends upon the

infiltration of rainfall from previous rains and the rate of runoff.

This Memphis soil is well suited to trees, including cherrybark oak, southern red oak, yellow poplar, loblolly pine, and sweetgum. The main limitation in managing timber is the susceptibility of this soil to compaction, rutting, and erosion. Plant competition is also a concern in management. Rutting and compaction are caused by using heavy equipment during wet periods. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall and using low-pressure ground equipment damage the soil less and help to maintain productivity. Erosion can be controlled by maintaining plant cover, locating roads and logging trails on the contour, and avoiding use of heavy equipment during wet periods. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation.

This soil is only moderately suited to residential uses. The steepness of slope and moderate permeability are severe limitations for septic tank absorption fields. Plant cover is needed to control erosion. The moderately steep slope is a severe limitation for commercial and industrial developments. Low strength is a severe limitation for local roads and streets. Proper design and construction can help minimize the effects of these limitations.

This Memphis soil is in capability subclass VIe.

Mo—Morganfield silt loam, occasionally flooded. This soil is deep, nearly level, and well drained. It is on flood plains, and individual areas are about 10 to 200 acres. Slopes range from 0 to 2 percent.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
0 to 8 inches; yellowish brown silt loam
Substratum:
8 to 41 inches; yellowish brown and brown silt loam
41 to 62 inches; mottled silt loam in shades of brown and gray

Included with this soil in mapping are areas of a soil that is strongly acid in one or more subsurface layers. A few small areas of the moderately well drained Adler soils are also included.

Important soil properties:

Permeability: moderate
Available water capacity: high
Natural fertility: moderate
Soil reaction: medium acid to neutral except in some areas the soil has a layer that is strongly acid
Flood hazard: occasional, brief duration, in winter or early in spring
High water table: seasonal, within a depth of about 3 or 4 feet in winter and early in spring
Root zone: to a depth of more than 40 inches

In most areas, this Morganfield soil is used for crops, mainly cotton, soybeans, and corn. In a few areas, it is used for hay or pasture.

This soil is well suited to all commonly grown crops and to use as pasture. Small grains and alfalfa produce high yields, but they are subject to some damage from flooding. Fertilizer, applied according to soil test recommendations, is important for sustained maximum yields.

This Morganfield soil is well suited to bottom land hardwoods, including green ash, yellow poplar, eastern cottonwood, American sycamore, and sweetgum. The main limitation in managing timber is the susceptibility of this soil to compaction and rutting. Plant competition is also a concern in management. Rutting and compaction are caused by using heavy equipment during wet periods. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall and using low-pressure ground equipment will damage the soil less and help to maintain productivity. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation.

This soil is not suited to most urban uses because of the susceptibility to flooding and a seasonal high water table. This soil is not suited to use as sites for septic tank absorption fields because of the hazard of flooding. Low strength is a severe limitation for local roads and streets.

This Morganfield soil is in capability subclass IIw.

Ro—Rosebloom silt loam, frequently flooded. This soil is deep and poorly drained. It is on flood plains, and individual areas are about 10 to 500 acres. Slopes range from 0 to 1 percent.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
0 to 5 inches; brown silt loam, mottles in shades of gray
Subsoil:
5 to 25 inches; light brownish gray silt loam, brown and red mottles
25 to 44 inches; gray silty clay loam, brown and red mottles
Substratum:
44 to 62 inches; gray silt loam, mottles in shades of brown

Included with this soil in mapping are a few small areas of Routon soils. Also included are a few small areas of somewhat poorly drained Arkabutla soils.

Important soil properties:

Permeability: moderate
Available water capacity: high
Natural fertility: medium
Soil reaction: strongly acid or very strongly acid except where lime has been added
Flood hazard: frequent, generally several days duration in winter and spring
High water table: seasonal, within a depth of 1 foot of the surface
Root zone: to a depth of more than 40 inches in summer; restricted by water table in winter and spring

In most areas, this Rosebloom soil is used as woodland. In a few areas, it is cleared and is protected from flooding by levees. The soil in the protected areas is used for some soybeans or pasture.

This soil generally is not suited to use as cropland. The frequent flooding and poor drainage make seedbed preparation, cultivation, and harvesting operations difficult, expensive, and often impossible. Only water-tolerant summer annuals can be productive in a few areas that have been artificially drained.

This soil is only moderately suited to use as pasture. Wetness and frequent flooding make grazing in winter and early in spring impractical in most years. Tall fescue tolerates wetness better than most other forage plants. Weeds are a problem on this soil; therefore, clipping or spraying with herbicides is needed.

This Rosebloom soil is well suited to bottom land hardwoods, including green ash, eastern cottonwood, water oak, willow oak, American sycamore, and sweetgum. The main limitation in managing timber is the susceptibility of this soil to compaction and rutting. Plant competition and seedling mortality are also concerns in management. Rutting and compaction are caused by using heavy equipment during wet periods. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall and using low-pressure ground equipment will damage the soil less and help to maintain productivity. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation.

This soil is not suited to most urban uses because of the susceptibility to flooding and a seasonal high water table. Low strength is a severe limitation for local roads and streets, and the severe hazard of flooding. This soil is not suited to use as sites for septic tank absorption fields because of the hazard of flooding.

This Rosebloom soil is in capability subclass Vw.

RS—Rosebloom silt loam, ponded. This soil is deep and poorly drained. It is in the lowest areas of the larger flood plains, and individual areas are about 10 to 500 acres. Slopes range from 0 to 1 percent. Fewer observations were made in areas of this soil because ponding made close observation impractical. The mapping, however, was sufficiently controlled for the expected uses of the soil.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
0 to 5 inches; grayish brown silt loam, mottles in shades of gray
Substratum:
5 to 62 inches; gray silt loam, mottles in shades of brown and red

Included with this soil in mapping are a few small areas of soils that are slightly higher in elevation and are ponded only for short periods. The somewhat poorly drained Arkabutla soils are among these included soils.

Important soil properties:

Permeability: moderate
Available water capacity: high
Natural fertility: low
Soil reaction: strongly acid or very strongly acid except where lime has been added
Flood hazard: frequent; brief to long duration in winter and spring
High water table: ponded 1 foot to 2 feet above the surface several months each year; 1 foot to 2 feet below the surface the rest of the year
Root zone: shallow

Most areas of this soil are in baldcypress, water tupelo, buttonbush, and in some open areas are shrubs, sedges, cattails, and water lilies. Other areas have dead or dying bottom land hardwoods.

This soil is not suited to use as cropland, pasture, or for hay because of wetness, ponded water, and the hazard of frequent flooding.

This Rosebloom soil is moderately suited to water-tolerant trees, such as baldcypress (fig. 6), water tupelo, and black willow. Bottom land hardwoods were in some areas of this soil during the last 10 to 15 years, but were killed by the ponded water. Water ponded on this soil because the stream channels are blocked by sediment or by beaver dams.

This soil is not suited to urban uses because of wetness, ponded water, and the hazard of flooding. Low strength is a severe limitation for local roads and streets, and ponding and flooding are severe hazards. This soil is not suited to use as sites for septic tank absorption fields because of the hazard of flooding and ponded water.

This Rosebloom soil is in capability subclass VIw.

Rt—Routon silt loam. This soil is deep, nearly level, and poorly drained. It is on loess-covered stream terraces and in upland depressions. Individual areas are about 5 to 100 acres. Slopes range from 0 to 2 percent.

Figure 6.—Water-tolerant baldcypress grow well on Rosebloom silt loam, ponded. Water remains on the surface 6 months or more each year.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
0 to 9 inches; brown silt loam

Subsurface layer:
9 to 22 inches; light brownish gray silt loam, mottles in shades of brown

Subsoil:
22 to 31 inches; light brownish gray silt loam, mottles in shades of yellow
31 to 57 inches; grayish brown silty clay loam, mottles in shades of yellow and brown
57 to 63 inches; mottled silt loam in shades of brown, gray, and yellow

Substratum:
63 to 72 inches; yellowish brown silt loam, mottles in shades of gray

Included with this soil in mapping are a few small areas of the somewhat poorly drained Arkabutla and Center soils and a few areas of Rosebloom and Calhoun soils. Also included are a few small slick spots (areas high in sodium) (fig. 7).

Important soil properties:

Permeability: slow
Available water capacity: high
Natural fertility: low
Soil reaction: strongly acid to slightly acid except the substratum ranges to neutral
Flood hazard: none except for rare flooding in some areas of included soils along drainageways
High water table: seasonal, within about 1 foot of the surface
Root zone: to a depth of more than 40 inches in summer; restricted by water table in winter and in spring

Figure 7.—Most crops will not grow on slick (sodic) spots, such as in this area of Routon silt loam.

In most areas, this soil is used for soybeans. In a few areas, it is used for cotton, hay, or as pasture.

If drained, this soil is well suited to short-season annual crops, such as soybeans and grain sorghum. This soil is only moderately suited to corn and cotton. Seasonal wetness is the main limitation. Planting, cultivation, and harvesting operations are often delayed following periods of heavy rainfall. Surface drainage can be improved in some areas by open ditches or by smoothing the surface.

This soil is well suited to hay and to use as pasture, but plant selection and good management are important. The soil is well suited to plants that tolerate periods of soil wetness, such as tall fescue and white clover. It is poorly suited to deep-rooted plants that are sensitive to wetness, such as alfalfa, because germination is often inhibited and stands thin out prematurely.

This Routon soil is well suited to water-tolerant hardwoods, including eastern cottonwood, water oak, willow oak, cherrybark oak, and sweetgum. The main limitation in managing timber is the susceptibility of this soil to compaction and rutting. Plant competition and seedling mortality are also concerns in management. Rutting and compaction are caused by using heavy equipment during wet periods. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall and using low-pressure ground equipment will damage the soil less and help to maintain productivity. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation. Seasonal wetness also increases the seedling mortality rate.

This soil is poorly suited to most urban uses because of wetness and slow permeability. It has severe limitations for septic tank absorption fields because of slow permeability and a seasonal high water table. Low strength is a severe limitation for local roads and streets.

This Routon soil is in capability subclass IIIw.

SmE2—Smithdale fine sandy loam, 12 to 20 percent slopes, eroded. This soil is deep, well drained, and moderately permeable. It is on moderately steep hillsides, and individual areas are about 5 to 50 acres.

The typical sequence, depth, and composition of the layers of this soil are—

Surface layer:
0 to 4 inches; dark brown fine sandy loam

Subsurface layer:
4 to 12 inches; brown fine sandy loam

Subsoil:

12 to 50 inches; yellowish red sandy clay loam
50 to 65 inches; yellowish red sandy loam

In most areas of this soil, part of the original surface layer has eroded away. In a few small areas, the soil is somewhat less eroded. Large gullies are in widely spaced intervals in some areas.

Included with this soil in mapping are a few small areas of Lexington soils and a few small areas of the moderately well drained Loring soils. Also included are soils similar to the Loring soils except that the fragipan is loamy.

Important soil properties:

Permeability: moderate in the upper part; moderately rapid below a depth of about 4 feet
Available water capacity: moderate
Natural fertility: low
Soil reaction: strongly acid or very strongly acid except where lime has been added
Flood hazard: none
Erosion hazard: severe
High water table: none within 6 feet of the surface
Root zone: to a depth of more than 40 inches

In most areas, this soil is used as woodland. In a few areas, it is used as pasture.

This soil is not suited to use as cropland. Row crops are impractical because of the moderately steep slopes, high erodibility, and high rate of runoff. If crops are grown, yields are low because the soil is drouthy.

This soil is moderately suited to hay and to use as pasture. Permanent plant cover is needed to prevent a high rate of erosion. Hardy forage plants, such as tall fescue, sericea lespedeza, and bermudagrass, grow best on this soil. The high rate of runoff causes a soil moisture deficit late in summer of most years, and stands of less hardy plants are weakened or killed. Lime and fertilizer, applied according to soil test recommendations, are necessary for sustained maximum yields.

This Smithdale soil is well suited to drouth-resistant trees, including southern red oak, loblolly pine, and shortleaf pine. The main limitation in managing timber is the susceptibility of this soil to compaction, rutting, and erosion. Plant competition is also a concern in management. Rutting and compaction are caused by using heavy equipment during wet periods. Puddling can also occur when the soil is wet. Logging during dry periods in summer and fall and using low-pressure ground equipment will damage the soil less and help to maintain productivity. Erosion can be controlled by maintaining plant cover, locating roads and logging trails on the contour, and avoiding use of heavy equipment during wet periods. Adequate site preparation and maintenance are needed to keep undesirable plants from interfering with natural or artificial reforestation. Fertilizer and lime can increase the growth rate and produce a better stand of seedlings.

This soil is poorly suited to most urban uses because of the moderately steep slopes. Slopes are a severe limitation for septic tank absorption fields and local roads and streets.

This Smithdale soil is in capability subclass VIe.

Prime Farmland

In this section, prime farmland is defined and discussed, and the prime farmland soils in Crockett County are listed.

Prime farmland is one of several kinds of important farmland defined by the U.S. Department of Agriculture. It is of major importance in meeting the nation's short- and long-range needs for food and fiber. The acreage of high-quality farmland is limited, and the U.S. Department of Agriculture recognizes that government at local, state, and federal levels, as well as individuals, must encourage and facilitate the wise use of our nation's prime farmland. The loss of prime farmland to other uses results in use of marginal land that is costly and environmentally undesirable.

Prime farmland soils, as defined by the U.S. Department of Agriculture, are soils that are best suited to producing food, feed, forage, fiber, and oilseed crops. Such soils have properties that are favorable for the economic production of sustained high yields of crops. The soils need only to be treated and managed using acceptable farming methods. The moisture supply, of course, must be adequate, and the growing season has to be sufficiently long. Prime farmland soils produce the highest yields with minimal inputs of energy and economic resources. Farming these soils results in the least damage to the environment.

Prime farmland soils may presently be in use as cropland, pasture, or woodland, or they may be in other uses. They either are used for producing food or fiber or are available for these uses. Urban or built-up land, public land, and water areas cannot be considered prime farmland. Urban or built-up land is any contiguous unit of land 10 acres or more in size that is used for such purposes as housing, industrial, and commercial sites, sites for institutions or public buildings, small parks, golf courses, cemeteries, railroad yards, airports, sanitary landfills, sewage treatment plants, and water control structures. Public land is land not available for farming in national forests, national parks, military reservations, and state parks.

Prime farmland soils usually get an adequate and dependable supply of moisture from precipitation or irrigation. The temperature and growing season are favorable. The acidity or alkalinity level of the soils is acceptable. The soils have few or no rocks and are permeable to water and air. They are not excessively erodible or saturated with water for long periods and are not subject to frequent flooding during the growing season. The slope ranges mainly from 0 to 5 percent.

About 88,290 acres, or 51 percent of Crockett County, meets the soil requirements for prime farmland. Areas of prime farmland are scattered throughout the county and are mostly used as cropland.

The following map units, or soils, make up prime farmland in Crockett County. The location of each map unit is shown on the detailed soil maps at the back of this publication. The extent of each map unit is given in table 4. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units." This list does not constitute a recommendation for a particular land use.

Soils that have limitations, such as a high water table or flooding, may qualify as prime farmland if these limitations are overcome by such measures as drainage or flood control. In the following list, the measures needed to overcome the limitations of a map unit, if any, are shown in parentheses after the map unit name. Onsite evaluation is necessary to determine if the limitations have been overcome by the corrective measures.

Ad	Adler silt loam, occasionally flooded
Ak	Arkabutla silt loam, occasionally flooded (where drained)
Ca	Calhoun silt loam (where drained)
Cb	Calloway silt loam
Cn	Center silt loam
GrB2	Grenada silt loam, 2 to 5 percent slopes, eroded
LoB2	Loring silt loam, 2 to 5 percent slopes, eroded
MeB2	Memphis silt loam, 2 to 5 percent slopes, eroded
Mo	Morganfield silt loam, occasionally flooded
Rt	Routon silt loam (where drained)

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis for predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern that is in harmony with nature.

Contractors can use this survey to locate sources of roadfill, and topsoil. They can use it to identify areas where wetness or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs *(11)*.

Crops and Pasture

John L. Kazda, agronomist, Soil Conservation Service, helped prepare this section.

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

Cropland is the major land use in Crockett County. In 1984, 36,000 acres was in soybeans, 3,200 acres was in grain sorghum, and 1,900 acres was in corn. According to the Tennessee Crop Reporting Service, Crockett County led the state with the production of 68,500 acres of cotton. These four crops accounted for the use of about 64 percent of the total land area of the county. About 10,000 acres of wheat was planted; however, much of it was double cropped with soybeans. Small acreages of other crops were grown, including strawberries, peppers, and tomatoes. The county has the potential to become a large producer of small fruit, vegetable, and orchard crops.

Soil erosion is the most important management problem, because of the large acreage of cropland and the high erodibility of the silty soils. Erosion is a major concern on more than 50 percent of the cropland in the county. Included is most of the acreage of the Grenada, Lexington, Loring, and Memphis soils.

Loss of the original surface layer by erosion is detrimental for several reasons. Productivity is decreased, plant nutrients are lost, and stream channels and drainage ditches are blocked by sediment.

Productivity is decreased as the surface layer is lost and part of the subsoil becomes incorporated into the plow layer. This is especially true on the more sloping soils, such as the severely eroded Loring and Grenada soils. Some soils have a layer in the subsoil that limits the depth of the root zone. In Crockett County, such layers include the fragipan that exists in many soils, for example, the Loring and Grenada soils. Tilling or preparing a good seedbed is difficult, and crops are damaged by a lack of moisture during dry periods.

Soil tilth, or workability, is an important factor in the germination of seeds and in the infiltration of water into the soil. Soils with good tilth are granular, porous, and easy to work. Most of the soils in the county have a surface layer of silt loam that is low to moderate in organic matter content. Generally, the structure of the

plow layer is weak or moderate. Intense rainfall causes the surface to crust. The crust is hard when dry, and somewhat impervious to water, which reduces infiltration and increases runoff. Regular additions of crop residue, manure, and other organic material improve soil structure and reduce crusting.

Plant nutrients are lost as a result of erosion and must be replaced by costly applications of fertilizer. Most of the soils in Crockett County are acid and are low or medium in plant nutrients. Commercial fertilizers and lime are needed for most crops to produce yields that are economically feasible. The use of fertilizers and lime should be based on the results of soil tests and on the nutrient requirements of the crop to be grown. The type of soil, desired yield level, and cropping practices for the most recent 3 to 5 years should also be considered. Information about soil test and fertilizer recommendations can be obtained from the local office of the Soil Conservation Service or the Cooperative Agricultural Extension Service.

Stream channels and drainage ditches are blocked by sediment as a result of soil erosion on uplands. The pollution caused by sediment and by chemicals, such as herbicides, that are attached to soil particles can be minimized by erosion control practices. Deposition of infertile sediment washed from severely eroded uplands onto productive bottom lands is also reduced when erosion is controlled.

Erosion control practices provide protective surface cover, reduce runoff, and increase infiltration of water. Using conservation tillage or incorporating high-residue crops into the cropping system will keep plant cover on the soil for extended periods and hold erosion losses down to amounts that will not reduce the productivity of the soil.

The practice of maintaining crop residue on the surface, which increases infiltration and reduces the hazards of runoff and erosion, can be adapted to most soils in the county, except those in steep or badly eroded areas. For row crops on sloping land, no-till or minimum tillage systems are effective in controlling erosion. These systems can be adapted to many soils in the county.

Terraces and diversions reduce the length of slope, thus reducing runoff and erosion. They are practical on deep, well drained soils that have uniform slopes. The Memphis, Lexington, and in places, Loring soils are suitable for terraces. The Grenada and Calloway soils are less suitable for terraces because their fragipan layers would be exposed in terrace channels.

Erosion control practices, such as contour crop rows and contour stripcropping, need to be used more in the county. Contour farming is best adapted to soils that have smooth, uniform slopes, such as most areas of the Memphis, Lexington, and Loring soils.

Information on the design of erosion control practices for each kind of soil is available from the local office of the Soil Conservation Service.

Pasture and hayland presently occupy only a small percentage of the total land area in the county. These land uses could become more important as conservation awareness becomes more widespread. Pasture and hayland consist of both cool-season and warm-season grasses and legumes. The main grasses are tall fescue, bermudagrass, and orchardgrass. The most common legumes are white clover, red clover, alfalfa, annual lespedeza, and sericea lespedeza. Legumes are included as part of the seed mixture for establishing pasture and are reintroduced in perennial grass stands when they make up less than about 30 percent of the pasture composition. On livestock farms, which require pasture and hay, legume and grass forage crops in the cropping system reduce erosion on sloping land, provide nitrogen, and maintain tilth.

The major management practices needed on pastures are fertilizing, liming, weed control, rotation grazing, and occasional renovation. Fertilizer should be applied according to plant needs as indicated by plant growth, the level of production desired, and the results of soil testing. Weeds can be controlled in pastures by using herbicides and by mowing before the weeds reach maturity and produce seed. Weed control is easier on well managed pastures than it is on overgrazed, poorly managed pastures.

Some annual grasses are used for supplemental grazing or for hay. Sudan-sorghum crosses, pearl millets, and sudangrass make good summer pasture. Small grain and annual ryegrass provide good grazing late in fall and early in spring.

Most harvested hay is surplus growth of grass-legume pastures. Annual lespedeza, sericea lespedeza, alfalfa, and small grains are also used for hay crops. Management for hay is generally the same as for pasture, except that more fertilizer is needed. Hay crops should be cut at the stage of growth that provides the best quality feed and does not damage the grass-legume stand. Cutting perennial hay crops too close causes premature loss of the stand.

Yields Per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that insures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local office of the Soil Conservation Service or of the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for use as cropland *(13)*. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major, and generally expensive, landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for rangeland, for woodland, and for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey. These levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. No class I or class VIII soils are recognized in Crockett County. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have few limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode, but they have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e* or *w* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless a close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage).

There are no subclasses in class I because the soils of this class have few limitations. The soils in class V are subject to little or no erosion, but they have other limitations that restrict their use to pasture, rangeland, woodland, wildlife habitat, or recreation. Class V contains only the subclass indicated by *w*.

The acreage of soils in each capability class and subclass is shown in table 6. The capability classification of each map unit is given in the section "Detailed Soil Map Units."

Woodland Management and Productivity

Joseph H. Paugh, forester, Soil Conservation Service, helped prepare this section.

Crockett County has 17,400 acres of commercial forest land, which is about 10 percent of the total land area. The entire county was originally forested until the fertile lands were cleared by settlers for farming. The present forested areas in Crockett County are mainly on uplands where the land is too steep to crop or in small woodlots near farmsteads and adjacent to drainageways.

Oaks and hickories are the predominant species and most trees are sawlog size. Stand volumes are high. Many average over 15,000 board feet per acre.

The potential for tree production is very high in Crockett County. Fifty to eighty-five cubic feet per acre per year is being produced on much of the acreage currently in trees. These same soils and others suited to trees could easily produce 85 to 155 cubic feet per acre per year if the areas are well-stocked with the proper species. Other uses for forest land include wildlife habitat and recreation. Forest land is also valued for the natural beauty, and conservation of soil and water.

Soils vary in their ability to produce trees. Depth, fertility, texture, and the available water capacity

influence tree growth. Elevation, aspect, and climate determine the kinds of trees that can grow on a site. Available water capacity and depth of the root zone are major influences of tree growth. Elevation and aspect are of particular importance in mountainous areas.

This soil survey can be used by woodland managers planning ways to increase the productivity of forest land. Some soils respond better to fertilization than others, some are more susceptible to landslides and erosion after building roads and harvesting timber, and some require special efforts to reforest. In the section "Detailed Soil Map Units," each map unit in the survey area suitable for producing timber presents information about productivity, limitations for harvesting timber, and management concerns for producing timber. Table 7 summarizes this forestry information and rates the soils for a number of factors to be considered in management. *Slight, moderate*, and *severe* are used to indicate the degree of the major soil limitations to be considered in forest management.

Ratings of the *erosion hazard* indicate the probability that damage may occur if site preparation activities or harvesting operations expose the soil. The risk is *slight* if no particular preventive measures are needed under ordinary conditions; *moderate* if erosion control measures are needed for particular silvicultural activities; and *severe* if special precautions are needed to control erosion for most silvicultural activities. Ratings of *moderate* or *severe* indicate the need for construction of higher-standard roads, additional maintenance of roads, additional care in planning of harvesting and reforestation operations, or use of specialized equipment.

Ratings of *equipment limitation* indicate limits on the use of forest management equipment, year-round or seasonal, because of such soil characteristics as slope, wetness, or susceptibility of the surface layer to compaction. As slope gradient and length increase, it becomes more difficult to use wheeled equipment. On the steeper slopes, tracked equipment must be used. On the steepest slopes, even tracked equipment cannot operate; more sophisticated systems are needed. The rating is *slight* if equipment use is restricted by soil wetness for less than 2 months and if special equipment is not needed. The rating is *moderate* if slopes are steep enough that wheeled equipment cannot be operated safely across the slope, if soil wetness restricts equipment use from 2 to 6 months per year, or if special equipment is needed to avoid or reduce soil compaction. The rating is *severe* if slopes are steep enough that tracked equipment cannot be operated safely across the slope, if soil wetness restricts equipment use for more than 6 months per year, or if special equipment is needed to avoid or reduce soil compaction. Ratings of *moderate* or *severe* indicate a need to choose the most suitable equipment and to carefully plan the timing of harvesting and other management operations.

Ratings of *seedling mortality* refer to the probability of death of naturally occurring or properly planted seedlings of good stock in periods of normal rainfall as influenced by kinds of soil or topographic features. *Seedling mortality* is caused primarily by too much water or too little water. The factors used in rating a soil for seedling mortality are texture of the surface layer, depth and duration of the water table, rooting depth, and the aspect of the slope. Mortality generally is greatest on soils that have a sandy or clayey surface layer. The risk is *slight* if, after site preparation, expected mortality is less than 25 percent; *moderate* if expected mortality is between 25 and 50 percent; and *severe* if expected mortality exceeds 50 percent. Ratings of *moderate* or *severe* indicate that it may be necessary to use containerized or larger than usual planting stock or to make special site preparations, such as bedding, furrowing, installing surface drainage, or providing artificial shade for seedlings. Reinforcement planting is often needed if the risk is *moderate* or *severe*.

Ratings of *plant competition* indicate the likelihood of the growth or invasion of undesirable plants. *Plant competition* becomes more severe on the more productive soils, on poorly drained soils, and on soils having a restricted root zone that holds moisture. The risk is *slight* if competition from undesirable plants reduces adequate natural or artificial reforestation but does not necessitate intensive site preparation and maintenance. The risk is *moderate* if competition from undesirable plants reduces natural or artificial reforestation to the extent that intensive site preparation and maintenance are needed. The risk is *severe* if competition from undesirable plants prevents adequate natural or artificial reforestation unless the site is intensively prepared and maintained. A *moderate* or *severe* rating indicates the need for site preparation to ensure the development of an adequately stocked stand. Managers must plan site preparation measures to ensure reforestation without delays.

The potential productivity of *common trees* on a soil is expressed as a *site index*. Common trees are listed in the order of their observed general occurrence. Generally, only two or three tree species dominate.

The soils that are commonly used to produce timber have the yield predicted in cubic feet and board feet. The yield is predicted at the point where mean annual increment culminates.

The *site index* is determined by taking height measurements and determining the age of selected trees within stands of a given species. This index is the average height, in feet, that the trees attain in a specified number of years. This index applies to fully stocked, even-aged, unmanaged stands. The procedure and technique for determining site index are given in the site index tables used for the Crockett County soil survey *(3, 4, 5, 6, 7, 8, 9, 10)*.

The *productivity class* represents an expected volume produced by the most important trees, expressed in cubic feet per acre per year.

Trees to plant are those that are used for reforestation or, if suitable conditions exist, natural regeneration. They are suited to the soils and will produce a commercial wood crop. Desired product, topographic position (such as a low, wet area), and personal preference are three factors of many that can influence the choice of trees to use for reforestation.

Recreation

Joseph H. Paugh, forester, Soil Conservation Service, helped prepare this section.

The soils in Crockett County generally are suitable for recreational uses, such as vacation cabins; camp grounds; picnic and sports areas; warm water fishing; small game hunting; natural, scenic, and historic areas; shooting preserves; and vacation farms. Soil characteristics should present no problem if careful consideration is given to the soil depth, permeability, texture, slope, and drainage.

In table 8, the soils of the survey area are rated according to the limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 8, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 8 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 11 and interpretations for dwellings without basements and for local roads and streets in table 10.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have gentle slopes and are not wet or subject to flooding during the period of use. The surface absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is firm after rains and is not dusty when dry. If grading is needed, the depth of the soil over a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Gerald Montgomery, biologist, Soil Conservation Service, helped prepare this section.

Crockett County has a varied population of wildlife and fish. The abundance and distribution of any particular species depends on the land use, amount of water, and kind of vegetation. Species that prefer open land, such as cropland, pastures, brushy fencerows, thickets, and scattered woodlots, include cottontail rabbits, bobwhite quail, mourning dove, meadowlark, eastern bluebird, groundhog, and coyote. These species are most abundant where there is a diversity of vegetation. Species that prefer the forested conditions of upland woodlots and bottom land hardwood tracts include white-tailed deer, grey squirrel, raccoon, and a variety of nongame birds. Shallow lakes and other wetlands on the Forked Deer River bottom land provide breeding habitat for wood ducks and resting and feeding areas for other migratory waterfowl. These wetlands also provide habitat for furbearers, such as beaver, mink, muskrat, and aquatic nongame birds.

The streams, lakes, and ponds of Crockett County support crappie, bream, largemouth bass, and catfish. Nongame species, such as gar, carp, buffalo, bowfin (grinnel), and drum, are also abundant, especially in lakes, oxbows, and sloughs on the Forked Deer River bottom land. Siltation, contamination by pesticides, and drainage are some of the major problems that have reduced the quality and quantity of fish habitat.

Most areas in the county could be improved for use as wildlife habitat by increasing the necessary food, water, and cover. Areas in general soil map units 2 and 5 are well suited to improvement of wildlife habitat for upland wildlife species. Map units 1, 3, and 4 on the general soil map are on bottom lands and low terraces and have potential for development as habitat for a variety of wildlife species, including waterfowl. The best wildlife habitat on the bottom lands currently is in map unit 1 because of extensive tracts of highly productive bottom land hardwood forests that remain in this area. Map units 3 and 4 are more intensively cropped and have large tracts of cleared land and few wooded tracts.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 9, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, soybeans, and wheat.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are fescue, switchgrass, orchardgrass, clover, annual lespedeza, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are ragweed, goldenrod, beggarweed, partridge pea, and broom sedge.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, the available water capacity, and wetness. Examples of these plants are oak, poplar, cherry, sweetgum, dogwood, hickory, and blackberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are shrub lespedeza, shrub honeysuckle, autumn olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, baldcypress, and red cedar.

Wetland plants are annual and perennial, wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, and slope. Examples of wetland plants are smartweed, wild millet, cattails, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are wetness, slope, and permeability. Examples of shallow water plants are coontail, spatterdock, lotus, waterlily, and pondweed.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants.

Habitat for wetland wildlife consists of open, marshy, or swampy shallow water areas.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet, and because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations must be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to: evaluate the potential of areas for residential, commercial, industrial, and recreational uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of earthfill and topsoil; plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 10 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to a very firm dense layer, soil texture, and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without

basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. Depth to a high water table and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost-action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, depth to a high water table, the available water capacity in the upper 40 inches, and the content of salts or sodium affect plant growth. Flooding, wetness, slope, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 11 shows the degree and the kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 11 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and that good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, and flooding affect absorption of the effluent.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 11 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally 1 foot or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, depth to a high water table, and flooding.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. Slope can cause construction problems.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 11 are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, slope, and flooding affect both types of landfill. Texture, soil reaction, and

content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 12 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a probable or improbable source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing estimated engineering index properties provides detailed information about each soil layer. This information can help determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by a high water table and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, or slopes of 15 to 25 percent. Depth to the water table is 1 foot to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 12, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, and toxic material.

Soils rated *good* have friable, loamy material to a depth of at least 40 inches. They have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and releases a variety of plant-available nutrients as it decomposes.

Water Management

Table 13 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas and embankments, dikes, and levees. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives the restrictive features that affect each soil for drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material. A high water table affects the amount of usable material. It also affects trafficability.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by slope and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts or sodium. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to reduce erosion and conserve moisture by intercepting runoff. Slope, wetness, and depth to a fragipan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of wind or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Wetness and slope affect the construction of grassed waterways. Low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, low fertility, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 14 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system *(2)* and the system adopted by the American Association of State Highway and Transportation Officials *(1)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area, or from nearby areas, and on field examination.

The estimates of grain-size distribution are rounded to the nearest 5 percent. Thus, if the ranges of gradation extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 15 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate, or component, consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They influence the soil's adsorption of cations, moisture retention, shrink-swell potential, permeability, plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth-moving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of movement of water through the soil when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage in each major soil layer is stated in inches of water per inch of soil. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion. Losses are expressed in tons per acre per year. These estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.02 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur over a sustained period without affecting crop productivity. The rate is expressed in tons per acre per year.

In table 15, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 16 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or

gravelly sands. These soils have a high rate of water transmission. This group is not applicable to soils in Crockett County.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission. In Crockett County, soils of the Memphis, Lexington, and Smithdale series are in Group B.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission. Soils of the Grenada, Loring, Calloway, Center, Adler, and Arkabutla series are in Group C.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission. Calhoun, Rosebloom, and Routon soils are in Group D.

Flooding, the temporary covering of the soil surface by flowing water, is caused by overflowing streams, by runoff from adjacent slopes, or by inflow from high tides. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in swamps and marshes or in a closed depression is considered ponding.

Table 16 gives the frequency, duration, and the time of year when flooding is most likely to occur.

Frequency, duration, and probable dates of occurrence are estimated. Frequency generally is expressed as *none, rare, occasional,* or *frequent. None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (there is a near 0 to 5 percent chance of flooding in any year). *Occasional* means that flooding occurs infrequently under normal weather conditions (there is a 5 to 50 percent chance of flooding in any year). *Frequent* means that flooding occurs often under normal weather conditions (there is more than a 50 percent chance of flooding in any year). Duration is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month). The time of year that floods are most likely to occur is expressed in months. November-May, for example, means that flooding can occur during the period November through May. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information on flooding is based on evidence in the soil profile, namely, thin strata of sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons, which are characteristic of soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 16 are the depth to the seasonal high water table; the kind of water table, that is, *perched* or *apparent;* and the months of the year that the water table commonly is highest. A water table that is seasonally high for less than 1 month is not indicated in table 16.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

The two numbers in the "High water table-Depth" column indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that the water table exists for less than a month.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severely corrosive environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and the amount of sulfates in the saturation extract.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(14)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or on laboratory measurements. Table 17 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders, primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplaquents (*Hapl*, meaning minimal horizonation, plus *aquent*, the suborder of the Entisols that has an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Haplaquents.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, nonacid, mesic Typic Haplaquents.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. There can be some variation in the texture of the surface layer or of the substratum within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the *Soil Survey Manual (12)*. Many of the technical terms used in the descriptions are defined in *Soil Taxonomy (14)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Adler Series

The Adler series consists of deep, moderately well drained, moderately permeable soils. These soils formed in recent silty alluvium that washed from the nearby uplands. They are on flood plains of the smaller creeks and branches. Slopes range from 0 to 2 percent.

Adler soils are commonly adjacent to Arkabutla, Grenada, Loring, Morganfield, and Routon soils. Arkabutla soils are on flood plains and are somewhat poorly drained. Grenada and Loring soils are on nearby uplands and have a fragipan. Morganfield soils are on slightly higher flood plains than the Adler soils and are

well drained. Routon soils are dominantly on stream terraces just above the flood plain and are poorly drained.

Typical pedon of Adler silt loam, occasionally flooded; in a cultivated field, 0.25 mile northeast of Emanuel Church on a county road, 50 feet west of the road, and 150 feet north of Odell Creek Channel:

Ap—0 to 8 inches; yellowish brown (10YR 5/4) silt loam; weak medium granular structure; very friable; many fine roots; slightly acid; abrupt smooth boundary.

C—8 to 27 inches; yellowish brown (10YR 5/4) silt loam; common medium faint pale brown (10YR 6/3) mottles and common medium distinct light brownish gray (10YR 6/2) mottles; massive; very friable; common fine roots; common thin pale brown horizontal strata 0.06 to 0.50 inch in thickness; medium acid; clear smooth boundary.

Cg1—27 to 48 inches; gray (10YR 6/1) silt loam; common medium distinct dark yellowish brown (10YR 4/4) and yellowish brown (10YR 5/4) mottles; massive; friable; few black manganese accumulations; medium acid; gradual smooth boundary.

Cg2—48 to 60 inches; gray (N 6/0, 10YR 6/1) silt loam; common medium distinct yellowish brown (10YR 5/4) mottles; massive; friable; common black manganese accumulations; medium acid.

The reaction is medium acid to neutral, except that some pedons have a strongly acid layer in the C or Cg horizon. The texture is silt loam or silt throughout.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4.

The C horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Mottles are few to many in shades of gray and brown. Depth to the Cg horizon is 24 inches or more. It has hue of 10YR, value of 4 to 7, and chroma of 1 or 2; or it is neutral and has value of 4 to 7. Mottles are few to many in shades of brown. Some pedons do not have a Cg horizon.

Arkabutla Series

The Arkabutla series consists of deep, somewhat poorly drained, moderately permeable soils. They formed in silty sediment deposited by slowly moving or still floodwaters. These soils are on broad flood plains of the Forked Deer River and the larger creeks. Slopes range from 0 to 2 percent.

Arkabutla soils are commonly adjacent to Calhoun, Rosebloom, and Routon soils. Calhoun and Routon soils are dominantly on stream terraces just above the flood plain. These soils have an argillic horizon and are poorly drained. Rosebloom soils are on the flood plain with Arkabutla soils, but they are slightly lower on the landscape and are poorly drained.

Typical pedon of Arkabutla silt loam, frequently flooded; in a wooded area, 1.5 miles east of Quincy and 0.6 mile north of Tennessee Highway 152:

A—0 to 5 inches; dark yellowish brown (10YR 4/4) silt loam; common medium distinct light gray (10YR 6/1) mottles; weak medium granular structure; friable; many fine and medium roots; strongly acid; gradual smooth boundary.

Bw—5 to 15 inches; dark yellowish brown (10YR 4/4) silt loam; common medium distinct light gray (10YR 6/1) mottles; weak medium subangular blocky structure; friable; few fine and medium roots; strongly acid; clear smooth boundary.

Bg—15 to 45 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct brown (7.5YR 4/4) mottles; weak medium subangular blocky structure; friable; strongly acid; clear smooth boundary.

Cg—45 to 72 inches; light gray (10YR 6/1) silt loam; common medium distinct brown (7.5YR 4/4) mottles and few medium distinct dark reddish brown (5YR 3/4) mottles; massive; friable; strongly acid.

The reaction is strongly acid or very strongly acid, except the surface layer is less acid where lime has been added. Texture is dominantly silt loam throughout, but includes silty clay loam. Content of clay ranges from 20 to 30 percent. Depth to horizons that are dominantly gray ranges from 10 to 20 inches.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. Mottles range from none to common in shades of brown and gray.

The Bw horizon dominantly has hue of 10YR, value of 4 or 5, chroma of 3 or 4, and mottles that have chroma of 2 or less. Some pedons have hue of 10YR, value of 4 or 5, and chroma of 2.

The Bg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. Mottles are in shades of brown.

The Cg horizon has the same colors as the Bg horizon, or it is neutral and has value of 5 to 7. Some pedons do not have a Cg horizon.

Calhoun Series

The Calhoun series consists of deep, poorly drained, slowly permeable soils. They formed in loess or a mixture of loess and alluvium washed mainly from loess-covered uplands. These nearly level soils are on stream terraces that are a few feet above the flood plain. Slopes range from 0 to 1 percent.

Calhoun soils are similar to Routon soils and are commonly adjacent to Arkabutla, Calloway, and Rosebloom soils. Routon soils do not have tonguing of the E horizon into the B horizon. Arkabutla and Rosebloom soils are on flood plains and do not have an argillic horizon. Calloway soils are on uplands and have a fragipan in the subsoil.

Typical pedon of Calhoun silt loam; in a cultivated field, 5.1 miles north of the intersection of Tennessee Highways 54 and 88 in Alamo, 900 feet west of Highway 54:

Ap—0 to 7 inches; brown (10YR 4/3) silt loam; weak medium granular structure; very friable; common fine roots; common medium black concretions; medium acid; abrupt smooth boundary.

Eg—7 to 19 inches; light gray (10YR 7/1) silt loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium and coarse granular structure; very friable; few fine roots; common medium black nodules; strongly acid; clear smooth boundary.

E/Bt—19 to 30 inches; light gray (10YR 7/1) silt loam tongues 2 to 4 inches wide; weak medium granular structure; very friable; common fine and medium pores (E part, about 55 percent); light brownish gray (10YR 6/2) silt loam; weak medium and coarse prismatic structure parting to weak medium subangular blocky; friable; common fine pores; patchy clay films; silt coatings on faces of prisms (B part, about 45 percent); common medium distinct yellowish brown (10YR 5/6) mottles; common medium black nodules; strongly acid; gradual wavy boundary.

Bt/E—30 to 51 inches; light brownish gray (10YR 6/2) silt loam; weak coarse prismatic structure parting to weak medium subangular blocky; friable; few fine pores; patchy clay films; silt coatings on faces of prisms (B part, about 70 percent); light gray (10YR 7/1) silt loam tongues 0.5 inch to 1.5 inches wide; weak medium granular structure; friable (E part, about 30 percent); few medium distinct yellowish brown (10YR 5/6) mottles; few medium and coarse black nodules; strongly acid; gradual wavy boundary.

Btg—51 to 65 inches; light brownish gray (2.5Y 6/2) silt loam; common medium distinct yellowish brown (10YR 5/6) mottles and few fine faint light gray mottles; weak coarse prismatic structure parting to weak coarse subangular blocky; friable, slightly brittle; patchy clay films; silt coatings on faces of prisms; slightly acid.

The solum is 48 to 80 inches thick. Reaction is very strongly acid to medium acid in the upper part and strongly acid to neutral in the lower part, except that the surface layer is less acid where lime has been added.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. Texture is silt loam.

The Eg horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. Mottles range from few to many in shades of brown. Texture is silt loam with content of clay less than 20 percent.

The Btg horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2, or hue of 2.5Y, value of 5 or 6, and chroma of 2. Mottles range from few to many in shades of brown and gray. Texture is silt loam or silty clay loam.

Some pedons have a BC or C horizon that has colors similar to those of the Btg horizon, or they are in shades of brown with gray mottles. Texture is silt loam.

Calloway Series

The Calloway series consists of deep, somewhat poorly drained soils that have a slowly permeable fragipan in the subsoil. These soils developed in loess. They are on low uplands or loess-covered stream terraces, and the surface is commonly slightly concave. Slopes range from 0 to 2 percent.

Calloway soils are similar to Center soils and are commonly adjacent to Calhoun and Grenada soils. Center soils do not have a fragipan. Calhoun soils are poorly drained and normally are below Calloway soils on the landscape. Grenada soils are moderately well drained and normally are above Calloway soils.

Typical pedon of Calloway silt loam; in a soybean field, 0.25 mile north of Bethel Church on a county road, 150 feet east of the road:

Ap—0 to 8 inches; brown (10YR 4/3) silt loam; weak medium granular structure; very friable; common fine and medium roots; common black nodules; strongly acid; abrupt smooth boundary.

Bw—8 to 17 inches; yellowish brown (10YR 5/4) silt loam; few medium distinct light brownish gray (10YR 6/2) mottles; moderate medium subangular blocky structure; friable; common fine roots; few clay films on vertical ped faces; common medium black and brown nodules; strongly acid; clear smooth boundary.

Eg—17 to 27 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct dark brown (7.5YR 4/4) and yellowish brown (10YR 5/6) mottles; weak medium granular structure; very friable; few fine roots; many medium and fine pores; common medium black and brown nodules; strongly acid; clear irregular boundary.

Bx/E—27 to 37 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct light gray (10YR 7/1) and brown (7.5YR 4/4) mottles; moderate medium and coarse prismatic structure parting to moderate medium subangular blocky; firm, brittle; few fine pores; patchy clay films on faces of peds and in pores; gray silt coatings on faces of prisms (Bx part, about 80 percent); light brownish gray (10YR 6/2) silt loam tongues 1 inch to 3 inches wide; few fine distinct yellowish brown (10YR 5/6) mottles; weak medium granular structure; friable; few fine roots; common fine and medium pores (E part); common small and medium black and brown nodules; strongly acid; gradual smooth boundary.

Bx1—37 to 55 inches; yellowish brown (10YR 5/4) silt loam; many medium distinct light gray (10YR 7/1) and brown (7.5YR 4/4) mottles; moderate coarse prismatic structure parting to weak medium subangular blocky; firm, brittle; few fine pores; patchy clay films on faces of peds and in pores; vertical tongues of light brownish gray silt loam 0.5 to 1 inch wide; light gray silt coatings on faces of prisms; few small black and brown nodules; strongly acid; gradual smooth boundary.

Bx2—55 to 65 inches; mottled brown (7.5YR 4/4), light gray (10YR 7/1), and yellowish brown (10YR 5/6) silt loam; weak very coarse prismatic structure; firm, brittle; few fine pores; patchy clay films; light gray silt coatings on faces of prisms; strongly acid.

The solum is more than 60 inches thick. Depth to the fragipan ranges from 18 to 38 inches. Reaction is medium acid to very strongly acid, except that the surface layer is less acid where lime has been added.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is silt loam.

The Bw horizon has hue of 10YR, value of 4 to 6, and chroma of 4 or 6. Mottles are few to many in shades of gray, and none to common in shades of brown. Texture is silt loam.

The Eg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. Mottles range from none to common in shades of brown. Texture is dominantly silt loam but ranges to silt.

The Bx horizon has hue of 10YR, value of 5, and chroma of 2 to 6. Mottles are few to common in shades of brown and gray. Texture is dominantly silt loam but ranges to silty clay loam.

Center Series

The Center series consists of deep, somewhat poorly drained soils that have moderately slow permeability. These soils developed in loess on stream terraces and in upland depressions. Most areas of these soils receive surface water from the surrounding higher areas. Slopes range from 0 to 2 percent.

Center soils are similar to the Calloway soils and are commonly adjacent to Calhoun, Grenada, Loring, and Routon soils. Calloway soils have a fragipan in the subsoil. Grenada and Loring soils are moderately well drained, have a fragipan, and normally are above Center soils on the landscape. Calhoun and Routon soils are poorly drained and normally are below Center soils on the landscape.

Typical pedon of Center silt loam; in a cultivated field, from the Crockett Mills water tank, 4.1 miles north on a county road, 0.6 mile east to a sharp curve, 0.3 mile southeast on a field road:

Ap—0 to 9 inches; brown (10YR 4/3) silt loam; weak medium granular structure; very friable; many fine roots; slightly acid; abrupt smooth boundary.

Bt1—9 to 18 inches; yellowish brown (10YR 5/4) silt loam; common medium distinct light brownish gray (10YR 6/2) mottles; weak medium subangular blocky structure; friable; common fine roots; common fine pores; patchy clay films in pores and on faces of peds; medium acid; clear smooth boundary.

Bt2—18 to 32 inches; yellowish brown (10YR 5/4) silt loam; many medium distinct light brownish gray (10YR 6/2) mottles and few medium faint strong brown (7.5YR 5/6) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; friable; few fine roots; common fine and medium pores; patchy clay films in pores and on faces of peds; medium acid; gradual wavy boundary.

Bt3—32 to 51 inches; mottled yellowish brown (10YR 5/4), light brownish gray (10YR 6/2), and strong brown (7.5YR 5/6) silt loam; weak coarse prismatic structure parting to weak medium subangular blocky; friable; patchy clay films on faces of peds; slightly acid; gradual smooth boundary.

C—51 to 72 inches; yellowish brown (10YR 5/6) silt loam; common medium distinct light brownish gray (10YR 6/2) and dark brown (7.5YR 4/4) mottles; massive; friable; slightly acid.

The solum is 30 to 60 inches thick. Reaction ranges from strongly acid to slightly acid, except that the lower part of the Bt horizon and the C horizon range from medium acid to neutral.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. Texture is silt loam.

Some pedons have a BA horizon up to 7 inches thick that has colors similar to those of the Bt horizon. Texture is silt loam.

The upper part of the Bt horizon has hue of 10YR, value of 4 or 5, and chroma of 4 to 6. Mottles that have chroma of 2 or less range from few to many. The lower part of the Bt horizon and the C horizon have colors similar to those of the upper part of the Bt horizon; they are mottled in shades of gray and brown or they have dominant chroma of 2 or less and mottles are in shades of brown. Texture of the Bt horizon is silt loam or silty clay loam, and the C horizon is silt loam.

Grenada Series

The Grenada series consists of deep, moderately well drained soils that have a slowly permeable fragipan in the subsoil. These soils formed in loess on low, gently sloping ridges and on sloping hillsides. Slopes range from 2 to 8 percent.

Grenada soils are commonly adjacent to Adler, Calloway, Center, and Loring soils. Adler soils are on

nearby flood plains and do not have an argillic horizon. Calloway and Center soils are somewhat poorly drained and normally are at somewhat lower elevations than Grenada soils. Loring soils commonly are in positions similar to those of the Grenada soils on highly dissected uplands and do not have an albic horizon immediately above the fragipan.

Typical pedon of Grenada silt loam, 2 to 5 percent slopes, eroded; in a cultivated field, 1.1 miles north of the Crockett County Courthouse, 50 feet west of Tennessee Highway 54:

Ap—0 to 6 inches; brown (10YR 5/3) silt loam; weak medium granular structure; friable; many fine roots; slightly acid; abrupt smooth boundary.

Bw1—6 to 17 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable; common fine roots; common medium and fine pores; few medium black nodules; strongly acid; clear smooth boundary.

Bw2—17 to 21 inches; yellowish brown (10YR 5/6) silt loam; common medium distinct pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; friable; common fine roots; common medium and fine pores; common medium and fine black nodules; light brownish gray silt coating on peds; strongly acid; clear smooth boundary.

E—21 to 25 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct yellowish brown (10YR 5/4) and dark brown (7.5YR 4/4) mottles; weak medium and coarse granular structure; very friable; few fine roots; many medium pores; common medium and fine black nodules; strongly acid; abrupt irregular boundary.

Btx/E1—25 to 43 inches; yellowish brown (10YR 5/6) silt loam; many medium distinct light brownish gray (10YR 6/2) and light gray (10YR 7/1) mottles; weak coarse prismatic structure parting to moderate medium subangular blocky; firm, brittle; common fine pores; common fine black nodules; clay films on faces of peds and in pores; nearly continuous light gray silt coatings on prism faces; light brownish gray (10YR 6/2) tongues between prisms (E part); strongly acid; gradual irregular boundary.

Btx/E2—43 to 62 inches; yellowish brown (10YR 5/6) silt loam; many medium distinct light brownish gray (10YR 6/2) and brown (7.5YR 4/4) mottles; moderate very coarse prismatic structure parting to weak medium subangular blocky; brittle; common fine pores; patchy clay films on faces of prisms; nearly continuous light gray (10YR 7/1) silt coatings on prism faces; common fine dark grayish brown and black nodules; light brownish gray (10YR 6/2) fingers and tongues between prisms (E part); strongly acid.

The solum is more than 60 inches thick, except in some severely eroded pedons the solum is slightly thinner. Depth to the fragipan normally ranges from 17 to 32 inches, except in some severely eroded pedons the depth is less. Reaction is medium acid to very strongly acid, except the surface layer is less acid where lime has been added.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 to 4. It is silt loam.

The Bw horizon has hue of 10YR, value of 4 to 6, and chroma of 4 or 6, or hue of 2.5Y, value of 5 or 6, and chroma of 4. Mottles in shades of brown range from none to common. Texture is dominantly silt loam but ranges to silty clay loam.

The E horizon is normally 2 to 4 inches thick and commonly forms tongues and fingers into the Btx horizon. It has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. Mottles in shades of brown range from few to many. Texture is silt loam or silt.

The Btx horizon has hue of 10YR, value of 4 or 5, and chroma of 3 to 6, or hue of 7.5YR, value of 4 or 5, and chroma of 4. Mottles are in shades of gray and brown. In some pedons, mottles are in shades of brown and gray, and no color is dominant. Texture is silt loam or silty clay loam. In most pedons, the fragipan is a Btx/E horizon.

Lexington Series

The Lexington series consists of deep, well drained, moderately permeable soils. These soils formed in 2 to 3 feet of loess and the underlying loamy coastal plain sediment. They are on narrow ridges and hillsides of hilly uplands. Slopes range from 2 to 12 percent.

Lexington soils are commonly adjacent to Loring, Memphis, and Smithdale soils. Loring and Memphis soils are in positions on the landscape similar to those of the Lexington soils, but they developed in loess more than 48 inches thick. Loring soils also have a fragipan. Smithdale soils are loamy throughout.

Typical pedon of Lexington silt loam, 2 to 5 percent slopes, severely eroded; in a cultivated field, 3.8 miles southeast from the intersection of Tennessee Highway 20 and U.S. Highway 79 on Highway 20, 0.4 mile south on a field road along a large ditch, 900 feet southwest on a field road, 30 feet north of the field road:

Ap—0 to 7 inches; dark brown (7.5YR 4/4) silt loam; weak medium granular structure; friable; strongly acid; clear smooth boundary.

Bt1—7 to 19 inches; dark brown (7.5YR 4/4) silty clay loam; strong medium subangular blocky structure; friable; many dark reddish brown clay films on faces of peds; common black stains on vertical faces of peds; strongly acid; clear smooth boundary.

Bt2—19 to 32 inches; dark brown (7.5YR 4/4) silt loam; moderate medium subangular blocky structure; friable; common reddish brown clay films on faces of peds; strongly acid; clear smooth boundary.

2Bt3—32 to 44 inches; dark brown (7.5YR 4/4) clay loam; moderate medium subangular blocky structure; friable; few reddish brown clay films on faces of peds; strongly acid; gradual smooth boundary.

2Bt4—44 to 53 inches; reddish brown (5YR 4/4) sandy loam; many pale brown (10YR 6/3) skeletans; weak medium subangular blocky structure; friable; patchy clay films on faces of peds; strongly acid; clear smooth boundary.

2E/Bt—53 to 72 inches; pale brown (10YR 6/3) loamy sand (E part); single grained; loose; alternating with 0.25 to 1 inch bands of reddish brown (5YR 4/4) sandy loam (Bt part); weak medium subangular blocky structure; very friable; strongly acid.

The solum is more than 60 inches thick. Reaction ranges from medium acid to very strongly acid, except that the surface layer is less acid where lime has been added.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4, or hue of 7.5YR, value of 4 or 5, and chroma of 4. Texture is silt loam.

The Bt horizon has hue of 7.5YR, value of 4 or 5, and chroma of 4 or 6. Texture is silt loam or silty clay loam.

The 2Bt horizon has hue of 7.5YR or 5YR, value of 4 or 5, and chroma of 4 to 8. Texture is sandy loam, loam, sandy clay loam, or clay loam. Horizons with a significant decrease in clay have skeletans or equivalent bodies.

Some pedons do not have a 2E/Bt horizon or it is below a depth of 60 inches.

Loring Series

The Loring series consists of deep, moderately well drained soils that have a slowly permeable fragipan in the subsoil. These soils formed in loess on gently sloping ridges and on moderately sloping to moderately steep hillsides on dissected uplands. Slopes range from 2 to 20 percent.

Loring soils are commonly adjacent to Center, Grenada, Memphis, and Lexington soils. Center soils are somewhat poorly drained, do not have a fragipan, and are on stream terraces and in upland depressions. Grenada soils have an albic horizon immediately above the fragipan. These soils normally are in positions similar to those of the Loring soils except the uplands are smoother. Memphis soils are well drained, do not have a fragipan, and commonly are on higher ridges than the Loring soils. Lexington soils are well drained and are loamy in the lower part of the subsoil.

Typical pedon of Loring silt loam, 2 to 5 percent slopes, eroded; in a cultivated field, 0.1 mile south and 0.4 mile east of Baker's Chapel Church:

Ap—0 to 7 inches; brown (10YR 4/3) silt loam; weak medium granular structure; friable; slightly acid; abrupt smooth boundary.

Bt1—7 to 21 inches; dark yellowish brown (10YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable; common clay films on faces of peds; strongly acid; gradual smooth boundary.

Bt2—21 to 30 inches; dark yellowish brown (10YR 4/4) silt loam; common medium distinct pale brown (10YR 6/3) mottles; moderate medium subangular blocky structure; friable; few clay films on faces of peds; strongly acid; clear wavy boundary.

Btx1—30 to 48 inches; dark brown (7.5YR 4/4) silt loam; many medium distinct yellowish brown (10YR 5/6) and light brownish gray (10YR 6/2) mottles; moderate coarse prismatic structure parting to moderate medium subangular blocky; firm, brittle; few clay films on faces of prisms; many light gray silt coatings on faces of prisms; light brownish gray (10YR 6/2) silt loam seams between prisms; common small black nodules; strongly acid; gradual smooth boundary.

Btx2—48 to 65 inches; dark brown (7.5YR 4/4) silt loam; common fine distinct light brownish gray (10YR 6/2) and yellowish brown (10YR 5/6) mottles; moderate very coarse prismatic structure parting to weak medium subangular blocky; firm, brittle; few clay films on faces of prisms; many light gray silt coatings on faces of prisms; light brownish gray (10YR 6/2) silt loam seams between prisms; common small black nodules; strongly acid.

The solum is 45 to 75 inches thick. Depth to the fragipan is 16 to 35 inches except in some severely eroded pedons. Reaction is medium acid to very strongly acid, except the surface layer is less acid where lime has been added.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4, or it has hue of 7.5YR, value of 4 or 5, and chroma of 4. The texture is silt loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. Mottles are none to common in shades of brown and gray in the lower part of the Bt horizon. The texture is silt loam or silty clay loam.

The Btx horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. Mottles range from few to many in shades of brown and gray. The texture is dominantly silt loam but ranges to silty clay loam.

Some pedons have a C horizon that has colors similar to those of the Btx horizon.

Memphis Series

The Memphis series consists of deep, well drained, moderately permeable soils. These soils formed in thick deposits of loess. They make up narrow convex ridgetops and hillsides of rolling and hilly uplands. They commonly occupy the highest ridges on the landscape. Slopes range from 2 to 20 percent.

Memphis soils are commonly adjacent to Grenada and Loring soils, but are also adjacent to Lexington and Smithdale soils in the eastern part of the county where the loess is thinner. Grenada and Loring soils are moderately well drained, have a fragipan, and normally are lower than Memphis soils on the landscape. Lexington soils are loamy in the lower part of the subsoil, and Smithdale soils are loamy throughout.

Typical pedon of Memphis silt loam, 2 to 5 percent slopes, eroded; in a cultivated field, 0.9 mile east of the Lauderdale County line along Tennessee Highway 88, and 900 feet north of the highway:

Ap—0 to 6 inches; brown (10YR 4/3) silt loam; weak medium granular structure; friable; common medium and fine roots; medium acid; abrupt smooth boundary.

Bt1—6 to 21 inches; dark brown (7.5YR 4/4) silty clay loam; moderate medium subangular blocky structure; friable; few fine roots; many fine pores; many clay films on faces of peds; strongly acid; clear smooth boundary.

Bt2—21 to 36 inches; dark brown (7.5YR 4/4) silt loam; moderate medium subangular blocky structure; friable; few fine roots; many fine pores; common clay films on faces of peds; strongly acid; clear smooth boundary.

Bt3—36 to 43 inches; dark brown (7.5YR 4/4) silt loam; moderate medium subangular blocky structure; few fine roots; common clay films on faces of peds; common light brownish gray silt coatings on vertical faces of peds; strongly acid; clear smooth boundary.

Bt4—43 to 61 inches; dark brown (7.5YR 4/4) silt loam; weak medium and coarse subangular blocky structure; friable; few clay films on faces of peds; common light brownish gray silt coatings on vertical faces of peds; strongly acid; gradual smooth boundary.

C—61 to 72 inches; dark brown (7.5YR 4/4) silt loam; massive; friable; few light brownish gray silt coatings in cracks; strongly acid.

The solum is 35 to more than 60 inches thick. Reaction is commonly strongly acid but ranges from medium acid to very strongly acid, except that the surface layer is less acid where lime has been added.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4, or hue of 7.5YR, value of 4, and chroma of 4. Texture is silt loam.

The Bt horizon has hue of 10YR or 7.5YR, value of 4 or 5, and chroma of 4 or 6. Some pedons have grayish silt coatings on faces of peds, and some have dark coatings on peds. The upper part of the Bt horizon is silt loam or silty clay loam, and the lower part is silt loam.

The C horizon has the same colors and texture as the lower part of the Bt horizon.

Morganfield Series

The Morganfield series consists of deep, well drained, moderately permeable soils. These soils formed in recent silty alluvium on flood plains. They normally are in long, narrow areas adjacent to channels of the smaller streams. Slopes range from 0 to 2 percent.

Morganfield soils are commonly adjacent to Adler, Center, and Grenada soils. Adler soils are moderately well drained and occupy slightly lower positions on flood plains than the Morganfield soils. Center soils are somewhat poorly drained and are on stream terraces just above the flood plains. Grenada soils have a fragipan and are on uplands adjacent to the flood plains.

Typical pedon of Morganfield silt loam, occasionally flooded; in a cotton field, 0.4 mile north of Emanuel Church, 300 feet east of the road, and 30 feet north of Odell Creek:

Ap—0 to 8 inches; yellowish brown (10YR 5/4) silt loam; weak medium and fine granular structure; very friable; medium acid; abrupt smooth boundary.

C1—8 to 21 inches; yellowish brown (10YR 5/4) silt loam; massive; very friable; thin pale brown (10YR 6/3) horizontal strata; medium acid; clear smooth boundary.

C2—21 to 41 inches; brown (10YR 4/3) silt loam; common medium faint pale brown (10YR 6/3) mottles; massive; very friable; thin pale brown (10YR 6/3) horizontal strata; medium acid; clear smooth boundary.

C3—41 to 62 inches; mottled light brownish gray (10YR 6/2) and yellowish brown (10YR 5/4) silt loam; massive; friable; medium acid.

The reaction ranges from medium acid to neutral, except some pedons have at least one layer that is strongly acid.

The Ap horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Texture is silt loam.

The upper part of the C horizon has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. Some pedons have mottles in shades of brown to a depth of 20 inches and mottles in shades of brown and gray below that. The lower part of the C horizon has hue of 10YR, value of 4 to 6, and chroma of 2 to 4. In some pedons, mottles have no dominant color. The C horizon is silt loam or silt.

Rosebloom Series

The Rosebloom series consists of deep, poorly drained, moderately permeable soils. These soils formed in silty sediment deposited by slow-moving or still floodwater. They are on broad, low flood plains of the Forked Deer River and the larger creeks. Slopes range from 0 to 1 percent.

Rosebloom soils are commonly adjacent to Arkabutla, Calhoun, and Routon soils. Arkabutla soils are on the flood plain with Rosebloom soils, but are slightly higher on the landscape and are somewhat poorly drained. Calhoun and Routon soils have an argillic horizon and are dominantly on stream terraces just above the flood plain.

Typical pedon of Rosebloom silt loam, frequently flooded; in a wooded area, 150 yards south of the Middle Fork Forked Deer River, and 600 yards east of the Eaton Levee Road:

A—0 to 5 inches; brown (10YR 4/3) silt loam; common medium distinct light brownish gray (10YR 6/2) and light gray (10YR 7/1) mottles; weak medium granular structure; friable; many fine and medium roots; strongly acid; clear smooth boundary.

Bg1—5 to 25 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct brown (7.5YR 4/4) and red (2.5YR 5/8) mottles; weak medium subangular blocky structure; friable; common fine and medium roots; few small black nodules; strongly acid; clear smooth boundary.

Bg2—25 to 44 inches; gray (10YR 6/1) silty clay loam; few medium distinct brown (7.5YR 4/4) and red (2.5YR 5/8) mottles; weak medium subangular blocky structure; friable; few fine roots; few small black nodules; strongly acid; gradual smooth boundary.

Cg—44 to 62 inches; gray (10YR 6/1) silt loam; few medium distinct brown (7.5YR 4/4) and pale brown (10YR 6/3) mottles; massive; few small black nodules; friable; strongly acid.

The reaction is strongly acid or very strongly acid, except that the surface layer is less acid where lime has been added.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. Texture is dominantly silt loam but includes silty clay loam.

The Bg horizon has hue of 10YR, value of 4 to 6, and chroma of 1, or value of 6 or 7, and chroma of 2. Mottles are few to many in shades of brown and red. In some pedons, mottles are in shades of gray and brown, and no color is dominant. Texture is silt loam or silty clay loam.

The Cg horizon has the same colors and textures as those of the Bg horizon.

Routon Series

The Routon series consists of deep, poorly drained, slowly permeable soils. These soils formed in loess or a mixture of loess and silty alluvium. They are dominantly on stream terraces but a few areas are along drainageways and in slight depressions on low-lying uplands. Slopes range from 0 to 2 percent.

Routon soils are commonly adjacent to Adler, Arkabutla, Center, and Rosebloom soils. Adler and Arkabutla soils are on flood plains and are better drained than the Routon soils. Center soils normally are higher on the landscape than Routon soils and are somewhat poorly drained. Rosebloom soils are on flood plains and do not have an argillic horizon.

Typical pedon of Routon silt loam; in a cultivated field, 3.4 miles north of Crockett Mills water tank, east on a field road, 0.7 mile to another field road, 300 feet south along east side of a fence row, 30 feet east of the fence row:

Ap—0 to 9 inches; brown (10YR 4/3) silt loam; weak medium granular structure; very friable; common fine roots; medium acid; abrupt smooth boundary.

Eg—9 to 22 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct yellowish brown (10YR 5/6) mottles; weak medium and coarse granular structure; very friable; common fine roots; medium acid; clear smooth boundary.

Btg1—22 to 31 inches; light brownish gray (10YR 6/2) silt loam; common medium distinct brownish yellow (10YR 6/8) mottles; weak medium prismatic structure parting to weak medium subangular blocky; friable; few fine roots; common gray clay films on faces of blocky peds; few light gray silt coatings on faces of prisms; 3-inch diameter crayfish tubes filled with gray silt loam; strongly acid; clear smooth boundary.

Btg2—31 to 53 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct brownish yellow (10YR 6/8) mottles; weak medium prismatic structure parting to weak medium subangular blocky; friable; common gray clay films on faces of blocky peds; few light gray silt coatings on faces of prisms; 3-inch diameter crayfish tubes filled with gray silt loam; medium acid; clear smooth boundary.

Btg3—53 to 57 inches; grayish brown (10YR 5/2) silty clay loam; common medium distinct yellowish brown (10YR 5/4) mottles; weak medium prismatic structure parting to weak medium subangular blocky; friable; common gray clay films on faces of blocky peds; few light gray silt coatings on faces of prisms; few fine black nodules; slightly acid; clear smooth boundary.

BCg—57 to 63 inches; mottled grayish brown (10YR 5/2), light brownish gray (10YR 6/2), and brownish yellow (10YR 6/8) silt loam; weak medium subangular blocky structure; friable; few gray clay films on faces of peds; few fine black nodules and stains; neutral; clear smooth boundary.

C—63 to 72 inches; yellowish brown (10YR 5/6) silt loam; many medium distinct light gray (10YR 6/1) mottles; massive; friable; common black stains; neutral.

The solum is 40 to 65 inches thick. Reaction is strongly acid to slightly acid, except that the BC and C horizons range to neutral.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. Texture is silt loam.

The Eg horizon has hue of 10YR, value of 6 or 7, and chroma of 1 or 2, and has mottles in shades of brown. Texture is silt loam.

The upper part of the Btg horizon has hue of 10YR or 2.5Y, value of 6, and chroma of 2, or hue of 10YR, value of 5 or 6, and chroma of 1. It has mottles in shades of yellow and brown. The lower part of the Btg horizon and the BCg horizon have the same color range as that of the upper part of the Btg horizon and in addition, they may be neutral and have value of 5 or 6, or be mottled in shades of brown, gray, or yellow. Texture of the Btg horizon is silt loam or silty clay loam. Texture of the BCg horizon is silt loam.

The C horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 to 6. Mottles are in shades of brown and gray. Texture is silt loam.

Smithdale Series

The Smithdale series consists of deep, well drained, moderately permeable soils. These soils formed in loamy Coastal Plain sediment. They are on hillsides of hilly, dissected uplands. Slopes range from 12 to 20 percent.

Smithdale soils are commonly adjacent to Lexington, Loring, and Memphis soils. Lexington soils are silty in the upper part and are less steep. Loring soils are silty and have a fragipan. Memphis soils are silty and are on ridgetops above Smithdale soils.

Typical pedon of Smithdale fine sandy loam, 12 to 20 percent slopes, eroded; from Gadsden, 1.7 miles south, 0.8 mile west on a county road, 300 yards east to a wooded hillside with a north aspect:

O—1 to 0 inch; hardwood leaves, twigs, and partly decomposed leaves and twigs.

A—0 to 4 inches; dark brown (10YR 4/3) fine sandy loam; moderate medium granular structure; very friable; many fine and medium roots; strongly acid; clear wavy boundary.

E—4 to 12 inches; brown (10YR 5/3) fine sandy loam; weak medium granular structure; very friable; many fine and medium roots; strongly acid; clear wavy boundary.

Bt1—12 to 37 inches; yellowish red (5YR 4/6) sandy clay loam; weak coarse prismatic structure parting to moderate medium subangular blocky; friable; common fine roots; few medium and fine pores; many red (2.5YR 4/6) clay films on faces of peds; strongly acid; gradual smooth boundary.

Bt2—37 to 50 inches; yellowish red (5YR 4/6) sandy clay loam; weak coarse prismatic structure parting to moderate medium subangular blocky; friable; common red (2.5YR 4/6) clay films; common pale brown (10YR 6/3) skeletans on prism faces; few small reddish yellow (7.5YR 6/6) sandy loam spherical bodies; very strongly acid; gradual smooth boundary.

Bt3—50 to 65 inches; yellowish red (5YR 5/6) sandy loam; weak medium subangular blocky structure; very friable; sand grains coated and bridged with clay; few pockets of uncoated sand grains; very strongly acid.

The solum is more than 60 inches thick. Reaction is strongly acid or very strongly acid throughout.

The A horizon is 2 to 5 inches thick. It has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. Some pedons have an Ap horizon. It has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. The texture of the A horizon is dominantly fine sandy loam, but ranges to loam.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. Texture is fine sandy loam or sandy loam.

The Bt horizon has hue of 5YR or 2.5YR, value of 4 or 5, and chroma of 6 or 8. Some pedons are mottled in shades of red and brown. The upper part of the Bt horizon is sandy clay loam or clay loam. The lower part is sandy loam or loam. Some pedons have pockets of uncoated sand grains.

Formation of the Soils

This section describes the processes and factors of soil formation as they relate to the soils in Crockett County.

Soils differ from one another because of the differences in the materials in which they formed and the different environments acting upon them. By studying the characteristics of an existing soil, one can build a model that shows the stages and many of the interrelated processes of the soil's formation. The characteristics of a soil provide a basis for its placement in the taxonomic system.

Factors of Soil Formation

Soils form as a result of the interaction of five major factors: *parent material,* acted upon by *climate* and *organisms*, as influenced by *topography*, over *time*. All of the factors influence the formation of every soil, but each factor varies in its degree of expression from place to place. The effect of any one factor is modified to some degree by the other four. The interactions of these soil-forming factors result in almost infinite degrees of their expression in soils. Each of the five major factors of soil formation is discussed briefly in the paragraphs that follow.

Parent Material

Parent material is the unconsolidated mass from which a soil forms. In Crockett County, most of the soils of the uplands formed in chemically altered loess deposits, while a few formed in old loamy Coastal Plain deposits. Alluvial soils formed on flood plains in materials washed from the uplands. The kind of parent material determines the limits of the mineralogical and chemical characteristics of the soil that forms in it.

As the materials exposed to weathering in this county were mainly thick deposits of loess or, in places, loamy Coastal Plain material, the residual soils reflect certain inherited characteristics of these parent materials. For example, the Loring, Grenada, Memphis, and Calloway soils are high in silt content but have very little sand. They formed in material weathered from thick deposits of loess. The Smithdale soils have a high percentage of sand. They weathered from thick deposits of loamy and sandy Coastal Plain sediments.

The alluvial soils formed in material washed from the uplands, and their characteristics reflect those of the soils of the uplands from which the sediment originated. Thus, the Adler, Arkabutla, and Rosebloom soils are high in silt content, because they formed in alluvium from silty uplands.

Climate

Climate directly affects the accumulation of parent material and the development of soil horizons. It regulates the rate of physical and chemical weathering of parent material, including the processes of leaching, eluviation, and illuviation. Climate also influences the plant and animal life in a given locality.

The warm and humid, temperate climate in this survey area favors rapid physical and chemical decomposition of soil particles, minerals, and organic matter. Intensive leaching, eluviation, illuviation, and oxidation are favored. The resulting soils are generally low in organic matter and medium or low in bases.

The local differences in climate, caused by variations in slope, drainage, and landform, affect soil formation. Steeper slopes are more rapidly eroded, and have higher rates of runoff than more gentle slopes. Areas that are nearly level or concave accumulate water from surrounding areas and may have several times as much water available for infiltration, percolation, and leaching. North-facing and east-facing slopes are generally cooler and stay moist longer than equivalent south-facing and west-facing slopes.

Organisms

Many of the processes by which parent material is transformed into soil are strongly influenced by living organisms and their remains and byproducts. Plant remains make up the main part of the organic matter that is incorporated into a soil. Other organisms, including earthworms, fungi, bacteria, insects, and various micro-organisms, also contribute to the organic matter content of a soil.

Organisms bring about both physical and chemical changes in soils. Mechanical mixing, separation of soil and rock particles, and reconstitution are the result of physical ingestion by simpler animals, tunnel and burrow formation, and the prying and penetrating action of roots. These mechanical changes in the soil result in deeper penetration of water and air and serve to deepen chemical weathering.

Plant roots absorb nutrients from deep within the soil material and transport them into leaf, twig, and stem tissues, which eventually die, fall to the soil surface, and enrich the soil. Organic acids resulting from the decay of organisms leach downward into the soil, removing bases and chemically altering clay minerals.

The soils in this survey area formed almost entirely under a forest of hardwoods. Differences existed in the density of the stands, in the relative proportions of species, and in the kinds of associated ground cover. These differences alone, however, were not sufficient to account for the marked differences in properties among the more strongly developed soils in the survey area.

Topography

Topography, including relief, slope, landform, and aspect, influences or modifies the effects of the other soil-forming factors. Steepness, shape, and length of slope directly influence the rates of infiltration and runoff. The greater the runoff, the more the erosion, assuming other factors are equal. The steeper slopes in some places have been truncated by gullies, in effect removing the soils formed in loess deposits and exposing the ancient Smithdale soil that had formed in loamy Coastal Plain sediment before the loess was deposited.

Concave slopes tend to concentrate water, and on gentler slopes more water infiltrates the soil. Free water moving downward through many local soil profiles is trapped or perched above a relatively impermeable fragipan layer, where it stands for days or weeks, or in some places moves away laterally.

Soils of the flood plains are periodically covered with fresh sediment washed from the uplands. This repeated deposition results in stratified soils that have minimal profile development.

Time

The time required for a soil to form depends upon the combined influences of the other factors of soil formation. Accumulation of parent material generally takes much more time than is required for the development of soil horizons. Less time is generally required for a soil to form in a warm, humid region having luxuriant vegetation than in a dry, cold region that has sparse vegetation. Less time is required if the parent material is permeable, on gentle slopes, and chemically highly weatherable. Much more time is required if the material is slowly permeable, chemically relatively inert, and on steeper slopes.

The soils in Crockett County range in age from young to very old. Most of the soils on flood plains are young. Examples include the Collins and Waverly soils. Most of the soils of the uplands are considerably older. They formed in silty loess deposits subjected to repeated weathering cycles over several thousand years. Examples include the Memphis, Loring, and Grenada soils.

The oldest soils in the county are those formed in ancient Coastal Plain sediment. They underlie the silty loess deposits throughout the county. They are exposed as the Smithdale soils on steep slopes where the loess deposits are washed away. The Smithdale soils formed over many thousands of years in sediment deposited millions of years ago.

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Glossary

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well-aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. Soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 40-inch profile or to a limiting layer is expressed as—

	Inches
Very low	less than 2.0
Low	2.0 - 4.0
Moderate	4.0 - 6.0
High	more than 6.0

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Bottom land. The normal flood plain of a stream, subject to flooding.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but that have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels, i.e., clay coating, clay skin.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Conservation tillage. A tillage system that does not invert the soil and that leaves a protective amount of crop residue on the surface throughout the year.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.
Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.
Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.
Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.
Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.
Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.
Soft.—When dry, breaks into powder or individual grains under very slight pressure.
Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:
Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.
Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.
Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.
Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.
Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.
Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.
Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.
Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.
Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, such as fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay are in the soil. The soil is not a source of gravel or sand for construction purposes.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fine textured soil. Sandy clay, silty clay, and clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the *Soil Survey Manual*. The major horizons of mineral soil are as follows:
O horizon.—An organic layer of fresh and decaying plant residue at the surface of a mineral soil.
A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a B horizon.
E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.
B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is, in part, a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as accumulation of clay, sesquioxides, humus, or a combination of these; prismatic or blocky structure; redder or browner colors than those in the A horizon; or a combination of these. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.
C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the A or B horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the Arabic numeral 2 precedes the letter C.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally,

material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material. This contrasts with percolation, which is movement of water through soil layers or material.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Sandy loam and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affects the specified use.

Permeability. The quality of the soil that enables water to move through the profile. Permeability is measured as the number of inches per hour that water moves through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Subsurface tunnels or pipelike cavities are formed by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of the acidity or alkalinity of a soil expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rooting depth (in tables). There is a shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Seepage (in tables). The movement of water through the soil adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Skeletans. Small, patchy grayish areas within a soil that have been largely stripped or eluviated of iron and clay, leaving mostly bleached silt-sized particles of quartz. May be considered an early step in the

formation of E horizons, silt coatings, and silt tongues.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil is generally silty or clayey, is slippery when wet, and is low in productivity.

Slippage (in tables). The soil mass is susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stripcropping. Growing crops in a systematic arrangement of strips or bands that provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the A2 horizon. Generally refers to a leached horizon lighter in color and lower in organic matter content than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Terrace. An embankment, or ridge, constructed on the contour or at a slight angle to the contour across sloping soils. The terrace intercepts surface runoff, so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material is too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Unstable fill (in tables). There is a risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Weathering. All physical and chemical changes produced by atmospheric agents in rocks or other deposits at or near the earth's surface. These changes result in disintegration and decomposition of the material.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically sunflower) wilts so much

that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Data recorded in the period 1951-81 at Brownsville, Tennessee]

Month	Temperature						Precipitation				
				2 years in 10 will have--				2 years in 10 will have--			
	Average daily maximum	Average daily minimum	Average daily	Maximum temperature higher than--	Minimum temperature lower than--	Average number of growing degree days*	Average	Less than--	More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	48.2	28.9	38.6	74	4	42	4.66	2.25	6.73	8	2.9
February---	53.1	32.1	42.6	77	8	59	4.57	2.46	6.42	7	1.7
March------	62.0	40.2	51.1	82	18	171	5.52	3.14	7.63	8	0.9
April------	73.8	50.6	62.2	88	30	370	5.60	3.16	7.75	8	0.0
May--------	81.3	58.2	69.8	94	39	614	4.96	2.46	7.12	7	0.0
June-------	88.6	66.0	77.3	99	50	819	3.54	1.80	5.06	5	0.0
July-------	91.5	69.6	80.6	100	55	949	4.23	1.92	6.21	6	0.0
August-----	90.8	67.7	79.3	100	53	908	3.15	0.83	5.00	5	0.0
September--	85.0	60.9	73.0	98	42	690	3.76	1.62	5.62	5	0.0
October----	75.2	48.6	61.9	92	29	378	2.39	1.01	3.58	4	0.0
November---	62.1	39.4	50.8	82	17	108	4.13	1.95	6.00	6	0.1
December---	52.1	32.5	42.3	74	9	32	4.50	2.23	6.46	7	0.5
Yearly:											
Average--	72.0	49.6	60.8	---	---	---	---	---	---	---	---
Extreme--	---	---	---	102	0	---	---	---	---	---	---
Total----	---	---	---	---	---	5,140	51.01	43.32	58.38	76	6.1

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (50 °F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Data recorded in the period 1951-81 at Brownsville, Tennessee]

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	March 26	April 3	April 14
2 years in 10 later than--	March 19	March 29	April 9
5 years in 10 later than--	March 5	March 20	April 1
First freezing temperature in fall:			
1 year in 10 earlier than--	November 3	October 27	October 16
2 years in 10 earlier than--	November 9	November 1	October 21
5 years in 10 earlier than--	November 19	November 9	October 29

TABLE 3.--GROWING SEASON

[Data recorded in the period 1951-81 at Brownsville, Tennessee]

Probability	Daily minimum temperature during growing season		
	Higher than 24 °F	Higher than 28 °F	Higher than 32 °F
	Days	Days	Days
9 years in 10	231	215	193
8 years in 10	241	221	199
5 years in 10	258	234	210
2 years in 10	276	246	221
1 year in 10	285	253	227

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
Ad	Adler silt loam, occasionally flooded	37,366	21.7
Ak	Arkabutla silt loam, occasionally flooded	2,796	1.6
Ar	Arkabutla silt loam, frequently flooded	8,195	4.8
Ca	Calhoun silt loam	4,558	2.6
Cb	Calloway silt loam	1,169	0.7
Cn	Center silt loam	9,572	5.6
GrB2	Grenada silt loam, 2 to 5 percent slopes, eroded	10,166	5.9
GrB3	Grenada silt loam, 2 to 5 percent slopes, severely eroded	24,985	14.5
GrC3	Grenada silt loam, 5 to 8 percent slopes, severely eroded	10,419	6.1
LeB3	Lexington silt loam, 2 to 5 percent slopes, severely eroded	355	0.2
LeC3	Lexington silt loam, 5 to 8 percent slopes, severely eroded	195	0.1
LeD3	Lexington silt loam, 8 to 12 percent slopes, severely eroded	888	0.5
LoB2	Loring silt loam, 2 to 5 percent slopes, eroded	8,931	5.2
LoB3	Loring silt loam, 2 to 5 percent slopes, severely eroded	5,665	3.3
LoC3	Loring silt loam, 5 to 8 percent slopes, severely eroded	10,279	6.0
LoD3	Loring silt loam, 8 to 12 percent slopes, severely eroded	13,202	7.7
LoE3	Loring silt loam, 12 to 20 percent slopes, severely eroded	1,526	0.9
MeB2	Memphis silt loam, 2 to 5 percent slopes, eroded	4,546	2.6
MeC3	Memphis silt loam, 5 to 8 percent slopes, severely eroded	1,441	0.8
MeD3	Memphis silt loam, 8 to 12 percent slopes, severely eroded	303	0.2
MeE3	Memphis silt loam, 12 to 20 percent slopes, severely eroded	302	0.2
Mo	Morganfield silt loam, occasionally flooded	4,865	2.8
Ro	Rosebloom silt loam, frequently flooded	3,804	2.2
RS	Rosebloom silt loam, ponded	2,112	1.2
Rt	Routon silt loam	4,321	2.5
SmE2	Smithdale fine sandy loam, 12 to 20 percent slopes, eroded	239	0.1
	Total	172,200	100.0

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Map symbol and soil name	Land capability	Cotton lint	Corn	Grain sorghum	Soybeans	Wheat	Alfalfa hay	Tall fescue
		Lbs	Bu	Bu	Bu	Bu	Tons	AUM*
Ad-------------- Adler silt loam	IIw	850	120	100	45	50	3.5	9.5
Ak-------------- Arkabutla silt loam	IIw	700	90	80	35	---	---	8.0
Ar-------------- Arkabutla silt loam	IVw	---	---	75	25	---	---	7.0
Ca-------------- Calhoun silt loam	IIIw	500	70	65	30	35	---	7.0
Cb-------------- Calloway silt loam	IIw	650	85	75	30	35	---	8.0
Cn-------------- Center silt loam	IIw	700	90	80	35	40	---	8.0
GrB2------------ Grenada silt loam	IIe	625	80	75	30	40	---	7.5
GrB3------------ Grenada silt loam	IIIe	525	65	55	20	35	---	7.0
GrC3------------ Grenada silt loam	IVe	500	---	---	20	30	---	6.0
LeB3------------ Lexington silt loam	IIIe	650	80	70	30	45	4.0	8.0
LeC3------------ Lexington silt loam	IVe	500	65	55	25	40	3.7	6.5
LeD3------------ Lexington silt loam	VIe	---	---	---	---	---	3.2	5.0
LoB2------------ Loring silt loam	IIe	725	90	75	35	45	3.8	7.5
LoB3------------ Loring silt loam	IIIe	625	75	65	25	40	---	6.5

See footnote at end of table.

TABLE 5.--LAND CAPABILITY CLASSES AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Cotton lint	Corn	Grain sorghum	Soybeans	Wheat	Alfalfa hay	Tall fescue
		Lbs	Bu	Bu	Bu	Bu	Tons	AUM*
LoC3------------ Loring silt loam	IVe	500	65	55	20	35	---	6.0
LoD3------------ Loring silt loam	VIe	---	---	---	---	---	---	5.5
LoE3------------ Loring silt loam	VIIe	---	---	---	---	---	---	5.0
MeB2------------ Memphis silt loam	IIe	800	100	85	40	45	4.5	8.5
MeC3------------ Memphis silt loam	IVe	650	75	65	28	40	4.2	7.5
MeD3------------ Memphis silt loam	VIe	---	---	---	---	---	3.8	7.0
MeE3------------ Memphis silt loam	VIe	---	---	---	---	---	3.5	6.0
Mo-------------- Morganfield silt loam	IIw	900	120	100	45	50	4.5	9.5
Ro-------------- Rosebloom silt loam	Vw	---	---	---	---	---	---	5.5
RS-------------- Rosebloom silt loam	VIw	---	---	---	---	---	---	---
Rt-------------- Routon silt loam	IIIw	500	70	65	34	35	---	7.0
SmE2------------ Smithdale fine sandy loam	VIe	---	---	---	---	---	---	4.5

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

TABLE 6.--CAPABILITY CLASSES AND SUBCLASSES

[Miscellaneous areas are excluded. Absence of an entry indicates no acreage]

Class	Total acreage	Major management concerns	
		Erosion (e)	Wetness (w)
		Acres	Acres
I	---	---	---
II	79,411	23,643	55,768
III	39,884	31,005	8,879
IV	30,529	22,334	8,195
V	3,804	---	3,804
VI	17,046	14,934	2,112
VII	1,526	1,526	---
VIII	---	---	---

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Map symbol and soil name	Management concerns: Erosion hazard	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Productivity class*	Trees to plant
Ad: Adler silt loam	Slight	Moderate	Moderate	Moderate	Yellow-poplar	115	129	Yellow poplar, green ash, sweetgum, American sycamore.
					Green ash	95	---	
					Sweetgum	100	143	
					American sycamore	115	186	
Ak: Arkabutla silt loam	Slight	Moderate	Moderate	Moderate	Cherrybark oak	105	172	Cherrybark oak, eastern cottonwood, green ash, loblolly pine, sweetgum, American sycamore, yellow-poplar.
					Eastern cottonwood	110	157	
					Green ash	95	---	
					Loblolly pine	100	129	
					Nuttall oak	110	---	
					Sweetgum	100	143	
					Water oak	100	100	
					Willow oak	100	100	
Ar: Arkabutla silt loam	Slight	Moderate	Moderate	Moderate	Cherrybark oak	105	172	Cherrybark oak, eastern cottonwood, green ash, loblolly pine, sweetgum, American sycamore.
					Eastern cottonwood	110	---	
					Green ash	95	---	
					Loblolly pine	100	129	
					Nuttall oak	110	---	
					Sweetgum	100	143	
					Water oak	100	100	
Ca: Calhoun silt loam	Slight	Moderate	Moderate	Severe	Cherrybark oak	95	129	Loblolly pine, sweetgum, willow oak.
					Sweetgum	90	100	
					Willow oak	90	100	
Cb: Calloway silt loam	Slight	Moderate	Slight	Moderate	Loblolly pine	80	129	Sweetgum, loblolly pine, white ash, willow oak, water oak.
					Cherrybark oak	80	114	
					Shortleaf pine	70	114	
					Sweetgum	80	86	
					Water oak	80	72	
Cn: Center silt loam	Slight	Moderate	Slight	Moderate	Southern red oak	75	57	Eastern cottonwood, water oak, sweetgum, American sycamore, southern red oak, cherrybark oak.
					Eastern cottonwood	95	114	
					Water oak	85	86	
					Sweetgum	90	100	
					Yellow-poplar	90	86	
					American sycamore	90	100	
					Cherrybark oak	95	129	
GrB2, GrB3: Grenada silt loam	Slight	Moderate	Slight	Moderate	Loblolly pine	85	114	Water oak, Shumard oak, cherrybark oak, loblolly pine, white oak, shortleaf pine, sweetgum.
					Southern red oak	80	57	
					Cherrybark oak	85	100	
					Shortleaf pine	75	114	
					Sweetgum	80	86	
GrC3: Grenada silt loam	Moderate	Moderate	Slight	Moderate	Loblolly pine	85	114	Water oak, Shumard oak, cherrybark oak, loblolly pine, white oak, shortleaf pine, sweetgum.
					Southern red oak	80	57	
					Cherrybark oak	85	100	
					Shortleaf pine	75	114	
					Sweetgum	80	86	

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Management concerns				Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
LeB3------------ Lexington silt loam	Slight	Moderate	Slight	Moderate	Southern red oak---- Cherrybark oak------ Loblolly pine------- Shortleaf pine------ Sweetgum------------ Yellow poplar-------	70 85 80 70 89 90	57 100 114 114 110 86	Cherrybark oak, yellow poplar, sweetgum, loblolly pine, shortleaf pine, southern red oak.
LeC3, LeD3------ Lexington silt loam	Moderate	Moderate	Slight	Moderate	Southern red oak---- Cherrybark oak------ Loblolly pine------- Shortleaf pine------ Sweetgum------------ Yellow poplar-------	70 85 80 70 89 90	57 100 114 114 100 86	Cherrybark oak, yellow poplar, sweetgum, loblolly pine, shortleaf pine, southern red oak.
LoB2, LoB3------ Loring silt loam	Slight	Moderate	Slight	Moderate	Southern red oak---- Cherrybark oak------ Sweetgum------------ Loblolly pine------- Water oak-----------	74 86 90 85 82	57 100 100 114 72	Yellow poplar, cherrybark oak, southern red oak, loblolly pine, shortleaf pine.
LoC3, LoD3------ Loring silt loam	Moderate	Moderate	Slight	Moderate	Southern red oak---- Cherrybark oak------ Sweetgum------------ Loblolly pine------- Water oak-----------	74 86 90 85 82	57 100 100 114 72	Yellow poplar, cherrybark oak, southern red oak, loblolly pine, shortleaf pine.
LoE3------------ Loring silt loam	Severe	Moderate	Slight	Moderate	Southern red oak---- Cherrybark oak------ Sweetgum------------ Loblolly pine------- Water oak-----------	74 86 90 85 82	57 100 100 114 72	Yellow poplar, cherrybark oak, southern red oak, loblolly pine, shortleaf pine.
MeB2----------- Memphis silt loam	Slight	Moderate	Slight	Moderate	Loblolly pine------- Cherrybark oak------ Sweetgum------------ Southern red oak---- Yellow poplar-------	90 90 90 75 95	129 114 100 57 100	Cherrybark oak, loblolly pine, yellow poplar, black walnut.
MeC3, MeD3----- Memphis silt loam	Moderate	Moderate	Slight	Moderate	Loblolly pine------- Cherrybark oak------ Sweetgum------------ Southern red oak----	90 90 90 75	129 114 100 57	Cherrybark oak, loblolly pine, yellow poplar.
MeE3----------- Memphis silt loam	Severe	Moderate	Slight	Moderate	Loblolly pine------- Cherrybark oak------ Southern red oak----	90 90 75	129 114 57	Cherrybark oak, loblolly pine, yellow poplar.
Mo------------- Morganfield silt loam	Slight	Moderate	Slight	Moderate	Eastern cottonwood-- Green ash----------- Sweetgum------------ Water oak----------- Yellow poplar-------	120 90 110 105 115	186 --- 172 100 129	Eastern cottonwood, green ash, sweetgum, American sycamore, yellow poplar.

See footnote at end of table.

TABLE 7.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Management concerns				Potential productivity			Trees to plant
	Erosion hazard	Equipment limitation	Seedling mortality	Plant competition	Common trees	Site index	Productivity class*	
Ro------------- Rosebloom silt loam	Slight	Severe	Moderate	Severe	Cherrybark oak------ Green ash----------- Eastern cottonwood-- Water oak----------- Willow oak---------- Sweetgum------------ American sycamore---	95 95 100 95 90 95 90	129 --- 129 86 86 114 100	Cherrybark oak, green ash, eastern cottonwood, water oak, willow oak, sweetgum.
RS------------- Rosebloom silt loam	Slight	Severe	Severe	Slight	Baldcypress--------- Water tupelo-------- Black willow--------	--- --- ---	--- --- ---	Baldcypress.
Rt------------- Routon silt loam	Slight	Moderate	Moderate	Severe	Cherrybark oak------ Water oak----------- White oak----------- Willow oak---------- Sweetgum------------	110 90 80 90 105	186 86 57 86 157	White ash, cherrybark oak, sweetgum, American sycamore, eastern cottonwood.
SmE2----------- Smithdale fine sandy loam	Moderate	Moderate	Slight	Moderate	Loblolly pine------- Shortleaf pine------	80 69	114 114	Loblolly pine, shortleaf pine.

* Productivity class is the yield in cubic feet per acre per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

TABLE 8.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Ad-------------------- Adler silt loam	Severe: flooding.	Moderate: wetness.	Moderate: wetness, flooding.	Slight----------	Moderate: flooding.
Ak-------------------- Arkabutla silt loam	Severe: flooding, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: wetness.
Ar-------------------- Arkabutla silt loam	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: flooding, wetness.	Moderate: flooding, wetness.	Severe: flooding, wetness.
Ca-------------------- Calhoun silt loam	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.	Severe: wetness.
Cb-------------------- Calloway silt loam	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
Cn-------------------- Center silt loam	Severe: wetness.	Moderate: wetness, percs slowly.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.
GrB2, GrB3------------ Grenada silt loam	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Moderate: wetness.	Moderate: wetness.
GrC3------------------ Grenada silt loam	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: slope.	Moderate: wetness.	Moderate: wetness.
LeB3------------------ Lexington silt loam	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
LeC3------------------ Lexington silt loam	Slight----------	Slight----------	Severe: slope.	Slight----------	Slight.
LeD3------------------ Lexington silt loam	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
LoB2, LoB3------------ Loring silt loam	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Slight----------	Slight.
LoC3------------------ Loring silt loam	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: slope.	Slight----------	Slight.
LoD3------------------ Loring silt loam	Moderate: slope, wetness, percs slowly.	Moderate: slope, wetness, percs slowly.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
LoE3------------------ Loring silt loam	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
MeB2: Memphis silt loam	Slight	Slight	Moderate: slope.	Slight	Slight.
MeC3: Memphis silt loam	Slight	Slight	Severe: slope.	Slight	Slight.
MeD3: Memphis silt loam	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.	Moderate: slope.
MeE3: Memphis silt loam	Severe: slope.	Severe: slope.	Severe: slope.	Severe: erodes easily.	Severe: slope.
Mo: Morganfield silt loam	Severe: flooding.	Slight	Moderate: flooding.	Slight	Moderate: flooding.
Ro: Rosebloom silt loam	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
RS: Rosebloom silt loam	Severe: flooding, ponding.	Severe: ponding.	Severe: ponding, flooding.	Severe: ponding.	Severe: ponding, flooding.
Rt: Routon silt loam	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.
SmE2: Smithdale fine sandy loam	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.

TABLE 9.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Potential for habitat elements: Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Potential as habitat for--: Openland wildlife	Woodland wildlife	Wetland wildlife
Ad: Adler silt loam	Good	Good	Good	Good	Fair	Poor	Poor	Good	Good	Poor.
Ak: Arkabutla silt loam	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Ar: Arkabutla silt loam	Poor	Fair	Fair	Good	Good	Fair	Fair	Fair	Good	Fair.
Ca: Calhoun silt loam	Poor	Fair	Fair	Good	Fair	Good	Good	Fair	Fair	Good.
Cb: Calloway silt loam	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Cn: Center silt loam	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
GrB2, GrB3: Grenada silt loam	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
GrC3: Grenada silt loam	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LeB3: Lexington silt loam	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LeC3, LeD3: Lexington silt loam	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
LoB2, LoB3: Loring silt loam	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
LoC3, LoD3: Loring silt loam	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
LoE3: Loring silt loam	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MeB2: Memphis silt loam	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MeC3, MeD3: Memphis silt loam	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MeE3: Memphis silt loam	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Mo: Morganfield silt loam	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Ro: Rosebloom silt loam	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.

TABLE 9.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
RS----------------- Rosebloom silt loam	Very poor.	Poor	Poor	Poor	Very poor.	Good	Good	Poor	Poor	Good.
Rt----------------- Routon silt loam	Poor	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair	Fair.
SmE2--------------- Smithdale fine sandy loam	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.

TABLE 10.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Ad---------------- Adler silt loam	Severe: wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
Ak---------------- Arkabutla silt loam	Severe: wetness, cutbanks cave.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding.	Severe: wetness.
Ar---------------- Arkabutla silt loam	Severe: wetness, cutbanks cave.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: low strength, flooding.	Severe: flooding, wetness.
Ca---------------- Calhoun silt loam	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
Cb---------------- Calloway silt loam	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
Cn---------------- Center silt loam	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength.	Moderate: wetness.
GrB2, GrB3-------- Grenada silt loam	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.	Moderate: wetness.
GrC3-------------- Grenada silt loam	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: low strength.	Moderate: wetness.
LeB3-------------- Lexington silt loam	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Severe: low strength.	Slight.
LeC3-------------- Lexington silt loam	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Severe: low strength.	Slight.
LeD3-------------- Lexington silt loam	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
LoB2, LoB3-------- Loring silt loam	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: low strength.	Slight.
LoC3-------------- Loring silt loam	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: low strength.	Slight.
LoD3-------------- Loring silt loam	Severe: wetness.	Moderate: wetness, slope.	Severe: wetness.	Severe: slope.	Severe: low strength.	Moderate: slope.
LoE3-------------- Loring silt loam	Severe: wetness, slope.	Severe: slope.	Severe: wetness, slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
MeB2: Memphis silt loam	Slight	Slight	Slight	Slight	Severe: low strength.	Slight.
MeC3: Memphis silt loam	Slight	Slight	Slight	Moderate: slope.	Severe: low strength.	Slight.
MeD3: Memphis silt loam	Moderate: slope.	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: low strength.	Moderate: slope.
MeE3: Memphis silt loam	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.	Severe: slope.
Mo: Morganfield silt loam	Moderate: cutbanks cave, wetness, flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Moderate: flooding.
Ro: Rosebloom silt loam	Severe: wetness, cutbanks cave.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: low strength, wetness, flooding.	Severe: wetness, flooding.
RS: Rosebloom silt loam	Severe: ponding, cutbanks cave.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, ponding, flooding.	Severe: ponding, flooding.
Rt: Routon silt loam	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: low strength, wetness.	Severe: wetness.
SmE2: Smithdale fine sandy loam	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

TABLE 11.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Ad------------------ Adler silt loam	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
Ak, Ar-------------- Arkabutla silt loam	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
Ca------------------ Calhoun silt loam	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Cb------------------ Calloway silt loam	Severe: wetness, percs slowly.	Slight-----------	Severe: wetness.	Severe: wetness.	Poor: wetness.
Cn------------------ Center silt loam	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
GrB2, GrB3, GrC3----- Grenada silt loam	Severe: wetness, percs slowly.	Moderate: seepage, slope.	Severe: wetness.	Moderate: wetness.	Fair: too clayey, wetness.
LeB3, LeC3----------- Lexington silt loam	Moderate: percs slowly.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Fair: too clayey.
LeD3----------------- Lexington silt loam	Moderate: percs slowly, slope.	Severe: seepage, slope.	Severe: seepage.	Severe: seepage.	Fair: too clayey, slope.
LoB2, LoB3, LoC3----- Loring silt loam	Severe: wetness, percs slowly.	Moderate: slope.	Moderate: wetness.	Moderate: wetness.	Fair: wetness.
LoD3----------------- Loring silt loam	Severe: wetness, percs slowly.	Severe: slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Fair: wetness, slope.
LoE3----------------- Loring silt loam	Severe: wetness, percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
MeB2, MeC3----------- Memphis silt loam	Moderate: percs slowly.	Moderate: seepage, slope.	Slight-----------	Slight-----------	Good.
MeD3----------------- Memphis silt loam	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: slope.
MeE3----------------- Memphis silt loam	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.

TABLE 11.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Mo------------------ Morganfield silt loam	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Fair: wetness.
Ro------------------ Rosebloom silt loam	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Poor: wetness.
RS------------------ Rosebloom silt loam	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Poor: ponding.
Rt------------------ Routon silt loam	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness.	Severe: wetness.	Poor: wetness.
SmE2---------------- Smithdale fine sandy loam	Severe: slope.	Severe: seepage, slope.	Severe: seepage, slope.	Severe: seepage, slope.	Poor: slope.

TABLE 12.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
Ad: Adler silt loam	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Good.
Ak, Ar: Arkabutla silt loam	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Ca: Calhoun silt loam	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Cb: Calloway silt loam	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Cn: Center silt loam	Fair: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
GrB2, GrB3, GrC3: Grenada silt loam	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: too clayey.
LeB3, LeC3: Lexington silt loam	Good	Improbable: excess fines.	Improbable: excess fines.	Good.
LeD3: Lexington silt loam	Good	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
LoB2, LoB3, LoC3: Loring silt loam	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
LoD3: Loring silt loam	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
LoE3: Loring silt loam	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
MeB2, MeC3: Memphis silt loam	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
MeD3: Memphis silt loam	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: slope.
MeE3: Memphis silt loam	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
Mo: Morganfield silt loam	Fair: low strength.	Improbable: excess fines.	Improbable: excess fines.	Good.
Ro, RS: Rosebloom silt loam	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Rt: Routon silt loam	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
SmE2: Smithdale fine sandy loam	Fair: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.

TABLE 13.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
Ad: Adler silt loam	Moderate: seepage.	Severe: piping.	Flooding	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Erodes easily.
Ak, Ar: Arkabutla silt loam	Moderate: seepage.	Severe: wetness.	Flooding	Wetness, erodes easily, flooding.	Erodes easily, wetness.	Erodes easily.
Ca: Calhoun silt loam	Slight	Severe: piping, wetness.	Percs slowly	Wetness, percs slowly, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily, percs slowly.
Cb: Calloway silt loam	Moderate: seepage.	Severe: thin layer.	Percs slowly	Wetness, percs slowly.	Erodes easily, wetness, rooting depth.	Wetness, erodes easily, rooting depth.
Cn: Center silt loam	Slight	Severe: piping, wetness.	Favorable	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
GrB2, GrB3: Grenada silt loam	Moderate: seepage.	Severe: piping.	Percs slowly	Wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, rooting depth.
GrC3: Grenada silt loam	Moderate: seepage, slope.	Severe: piping.	Percs slowly, slope.	Slope, wetness, percs slowly.	Erodes easily, wetness.	Erodes easily, rooting depth.
LeB3, LeC3: Lexington silt loam	Severe: seepage.	Severe: thin layer.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
LeD3: Lexington silt loam	Severe: seepage.	Severe: thin layer.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
LoB2, LoB3, LoC3: Loring silt loam	Slight	Moderate: piping, wetness.	Slope, percs slowly.	Percs slowly, rooting depth, slope.	Erodes easily, wetness, rooting depth.	Erodes easily, rooting depth.
LoD3, LoE3: Loring silt loam	Slight	Moderate: piping, wetness.	Slope, percs slowly.	Percs slowly, rooting depth, slope.	Slope, erodes easily, wetness.	Slope, erodes easily, rooting depth.
MeB2, MeC3: Memphis silt loam	Moderate: seepage.	Severe: piping.	Deep to water	Slope, erodes easily.	Erodes easily	Erodes easily.
MeD3, MeE3: Memphis silt loam	Moderate: seepage.	Severe: piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
Mo: Morganfield silt loam	Moderate: seepage.	Severe: piping.	Deep to water	Erodes easily, flooding.	Erodes easily	Erodes easily.
Ro: Rosebloom silt loam	Moderate: seepage.	Severe: wetness.	Flooding	Wetness, erodes easily.	Wetness, percs slowly.	Wetness, erodes easily.

TABLE 13.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Limitations for-- Embankments, dikes, and levees	Features affecting-- Drainage	Features affecting-- Irrigation	Features affecting-- Terraces and diversions	Features affecting-- Grassed waterways
RS----------------- Rosebloom silt loam	Moderate: seepage.	Severe: ponding.	Ponding, flooding.	Ponding, erodes easily, flooding.	Erodes easily, ponding.	Wetness, erodes easily.
Rt----------------- Routon silt loam	Slight---------	Severe: piping, wetness.	Percs slowly---	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
SmE2--------------- Smithdale fine sandy loam	Severe: seepage.	Severe: piping.	Deep to water	Slope----------	Slope----------	Slope.

TABLE 14.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated. Some soils have Unified classifications and USDA textures that are supplementary to those shown. In general, the dominant classifications and textures are shown, and the others are inferred]

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In								Pct	
Ad---------------- Adler silt loam	0-8	Silt loam--------	ML, CL-ML	A-4	100	100	100	95-100	<28	NP-7
	8-60	Silt loam, silt	ML, CL, CL-ML	A-4	100	100	95-100	60-95	<30	NP-10
Ak, Ar----------- Arkabutla silt loam	0-5	Silt loam--------	CL, CL-ML	A-4, A-6	100	100	85-100	60-95	25-35	7-15
	5-72	Silty clay loam, loam, silt loam.	CL	A-6, A-7	100	100	85-100	70-90	30-45	12-25
Ca---------------- Calhoun silt loam	0-30	Silt loam--------	CL-ML, ML, CL	A-4	100	100	100	95-100	<31	NP-10
	30-65	Silty clay loam, silt loam.	CL	A-6, A-7-6	100	100	95-100	95-100	30-45	11-24
Cb---------------- Calloway silt loam	0-27	Silt loam--------	CL-ML, CL	A-4, A-6	100	100	100	90-100	25-35	5-15
	27-65	Silt loam, silty clay loam.	CL	A-6	100	100	100	90-95	30-40	12-20
Cn---------------- Center silt loam	0-9	Silt loam--------	ML, CL, CL-ML	A-4, A-6	100	95-100	90-100	80-100	<30	3-11
	9-51	Silty clay loam, silt loam.	CL, ML	A-6, A-4	100	95-100	95-100	90-100	28-40	8-16
	51-72	Silt loam--------	ML, CL, CL-ML	A-4, A-6	100	95-100	90-100	80-100	<30	3-11
GrB2-------------- Grenada silt loam	0-6	Silt loam--------	ML, CL-ML	A-4	100	100	95-100	90-100	<30	NP-6
	6-21	Silt loam, silty clay loam.	CL	A-6, A-4	100	100	95-100	90-100	27-40	8-19
	21-25	Silt loam, silt	CL-ML, CL	A-4	100	100	95-100	90-100	20-30	5-10
	25-62	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-7, A-4	100	100	95-100	90-100	25-45	5-24
GrB3, GrC3-------- Grenada silt loam	0-5	Silt loam--------	ML, CL-ML	A-4	100	100	95-100	90-100	<30	NP-6
	5-14	Silt loam, silty clay loam.	CL	A-6, A-4	100	100	95-100	90-100	27-40	8-19
	14-18	Silt loam, silt	CL-ML, CL	A-4	100	100	95-100	90-100	20-30	5-10
	18-62	Silt loam, silty clay loam.	CL, CL-ML	A-6, A-7, A-4	100	100	95-100	90-100	25-45	5-24
LeB3, LeC3, LeD3- Lexington silt loam	0-7	Silt loam--------	ML, CL, CL-ML	A-4, A-6, A-7	100	95-100	90-100	70-100	25-42	5-16
	7-32	Silty clay loam, silt loam.	CL	A-6, A-7	100	95-100	90-100	75-100	27-45	11-25
	32-53	Sandy loam, loam, clay loam.	SC, SM-SC, CL, CL-ML	A-2, A-4, A-6	100	95-100	50-85	20-65	22-35	5-15
	53-72	Loamy sand, sandy loam, clay loam.	SC, SM-SC	A-2, A-4, A-6	100	95-100	50-70	20-40	22-35	5-15
LoB2-------------- Loring silt loam	0-7	Silt loam--------	ML, CL-ML, CL	A-4, A-6	100	100	95-100	90-100	<35	NP-15
	7-30	Silt loam, silty clay loam.	CL, ML	A-6, A-7, A-4	100	100	95-100	90-100	32-48	10-20
	30-65	Silt loam, silty clay loam.	CL, ML	A-4, A-6, A-7	100	100	95-100	90-100	30-45	10-22

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO	4	10	40	200		
	In								Pct	
LoB3, LoC3-------Loring silt loam	0-6	Silt loam--------	ML, CL-ML, CL	A-4, A-6	100	100	95-100	90-100	<35	NP-15
	6-20	Silt loam, silty clay loam.	CL, ML	A-6, A-7, A-4	100	100	95-100	90-100	32-48	10-20
	20-65	Silt loam, silty clay loam.	CL, ML	A-4, A-6, A-7	100	100	95-100	90-100	30-45	10-22
LoD3, LoE3-------Loring silt loam	0-5	Silt loam--------	ML, CL-ML, CL	A-4, A-6	100	100	95-100	90-100	<35	NP-15
	5-17	Silt loam, silty clay loam.	CL, ML	A-6, A-7, A-4	100	100	95-100	90-100	32-48	10-20
	17-62	Silt loam, silty clay loam.	CL, ML	A-4, A-6, A-7	100	100	95-100	90-100	30-45	10-22
MeB2-------------Memphis silt loam	0-6	Silt loam--------	ML, CL-ML, CL	A-4	100	100	100	90-100	<30	NP-10
	6-21	Silt loam, silty clay loam.	CL	A-6, A-7	100	100	100	90-100	35-48	15-25
	21-72	Silt loam--------	ML, CL	A-4, A-6	100	100	100	90-100	30-40	6-15
MeC3, MeD3, MeE3-Memphis silt loam	0-6	Silt loam--------	ML, CL-ML, CL	A-4	100	100	100	90-100	<30	NP-10
	6-15	Silt loam, silty clay loam.	CL	A-6, A-7	100	100	100	90-100	35-48	15-25
	15-65	Silt loam--------	ML, CL	A-4, A-6	100	100	100	90-100	30-40	6-15
Mo---------------Morganfield silt loam	0-8	Silt loam--------	ML, CL, CL-ML	A-4	100	100	95-100	65-95	<30	NP-10
	8-62	Silt loam, silt	ML, CL, CL-ML	A-4	100	100	95-100	65-95	<30	NP-10
Ro, RS-----------Rosebloom silt loam	0-5	Silt loam, silty clay loam.	CL	A-4, A-6	100	100	90-100	80-95	28-40	9-20
	5-62	Silt loam, silty clay loam.	CL	A-6, A-7	100	100	90-100	85-100	28-45	11-25
Rt---------------Routon silt loam	0-22	Silt loam--------	ML, CL, CL-ML	A-4, A-6	100	100	90-100	85-95	16-32	3-12
	22-57	Silt loam, silty clay loam.	CL, CL-ML	A-4, A-6	100	100	90-100	90-95	20-40	5-17
	57-72	Silt loam--------	ML, CL, CL-ML	A-4, A-6	100	100	90-100	85-95	16-32	3-12
SmE2-------------Smithdale fine sandy loam	0-12	Fine sandy loam	SM, SM-SC	A-4, A-2	100	85-100	60-95	28-49	<20	NP-5
	12-50	Clay loam, sandy clay loam, loam.	SM-SC, SC, CL, CL-ML	A-6, A-4	100	85-100	80-96	45-75	23-38	7-16
	50-65	Loam, sandy loam	SM, ML, CL, SC	A-4	100	85-100	65-95	36-70	<30	NP-10

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cc	In/hr	In/in	pH				Pct
Ad-----------------	0-8	10-25	1.50-1.55	0.6-2.0	0.20-0.23	5.6-7.3	Low-----------	0.43	5	.5-2
Adler silt loam	8-60	5-18	1.50-1.55	0.6-2.0	0.20-0.23	5.1-7.3	Low-----------	0.43		
Ak, Ar------------	0-5	5-25	1.40-1.50	0.6-2.0	0.20-0.22	4.5-5.5	Low-----------	0.43	5	1-3
Arkabutla silt loam	5-72	20-35	1.45-1.55	0.6-2.0	0.18-0.21	4.5-5.5	Low-----------	0.32		
Ca-----------------	0-30	10-27	1.30-1.65	0.2-0.6	0.21-0.23	4.5-6.0	Low-----------	0.49	5	.5-4
Calhoun silt loam	30-65	10-35	1.30-1.70	0.06-0.2	0.20-0.22	5.1-7.3	Moderate------	0.43		
Cb-----------------	0-27	10-30	1.40-1.55	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49	3	.5-2
Calloway silt loam	27-65	10-32	1.35-1.55	0.06-0.2	0.09-0.12	4.5-6.0	Low-----------	0.43		
Cn-----------------	0-9	12-24	1.35-1.50	0.6-2.0	0.18-0.22	5.1-6.5	Low-----------	0.49	5	1-3
Center silt loam	9-51	18-32	1.30-1.50	0.2-0.6	0.16-0.20	5.1-6.5	Low-----------	0.43		
	51-72	15-25	1.30-1.50	0.2-0.6	0.16-0.20	5.6-7.3	Low-----------	0.49		
GrB2---------------	0-6	12-16	1.40-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49	3	.5-2
Grenada silt	6-21	18-30	1.40-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.43		
loam	21-25	12-16	1.35-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49		
	25-62	15-32	1.45-1.60	0.06-0.2	0.10-0.12	4.5-6.0	Low-----------	0.37		
GrB3, GrC3--------	0-5	12-16	1.40-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49	3	.5-2
Grenada silt	5-14	18-30	1.40-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.43		
loam	14-18	12-16	1.35-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49		
	18-62	15-32	1.45-1.60	0.06-0.2	0.10-0.12	4.5-6.0	Low-----------	0.37		
LeB3, LeC3, LeD3-	0-7	12-30	1.30-1.50	0.6-2.0	0.17-0.22	4.5-6.0	Low-----------	0.49	3	.5-2
Lexington silt	7-32	20-33	1.40-1.55	0.6-2.0	0.16-0.21	4.5-6.0	Low-----------	0.43		
loam	32-53	15-29	1.30-1.50	2.0-6.0	0.06-0.12	4.5-6.0	Low-----------	0.24		
	53-72	9-30	1.20-1.55	2.0-6.0	0.05-0.10	4.5-6.0	Low-----------	0.24		
LoB2---------------	0-7	8-18	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49	3	.5-2
Loring silt loam	7-30	18-32	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low-----------	0.43		
	30-65	15-30	1.50-1.70	0.06-0.2	0.06-0.13	4.5-6.0	Low-----------	0.43		
LoB3, LoC3--------	0-6	8-18	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49	3	.5-2
Loring silt loam	6-20	18-32	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low-----------	0.43		
	20-65	15-30	1.50-1.70	0.06-0.2	0.06-0.13	4.5-6.0	Low-----------	0.43		
LoD3, LoE3--------	0-5	8-18	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49	3	.5-2
Loring silt loam	5-17	18-32	1.40-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low-----------	0.43		
	17-62	15-30	1.50-1.70	0.06-0.2	0.06-0.13	4.5-6.0	Low-----------	0.43		
MeB2---------------	0-6	8-22	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49	5	1-2
Memphis silt	6-21	20-35	1.30-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low-----------	0.49		
loam	21-72	12-25	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49		
MeC3, MeD3, MeE3-	0-6	8-22	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49	5	1-2
Memphis silt	6-15	20-35	1.30-1.50	0.6-2.0	0.20-0.22	4.5-6.0	Low-----------	0.49		
loam	15-65	12-25	1.30-1.50	0.6-2.0	0.20-0.23	4.5-6.0	Low-----------	0.49		
Mo-----------------	0-8	2-5	1.40-1.50	0.6-2.0	0.20-0.23	5.6-7.3	Low-----------	0.43	5	1-3
Morganfield silt loam	8-62	5-18	1.40-1.55	0.6-2.0	0.20-0.23	5.1-7.3	Low-----------	0.43		

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Organic matter
	In	Pct	G/cc	In/hr	In/in	pH				Pct
Ro, RS-----------	0-5	18-30	1.40-1.55	0.6-2.0	0.20-0.22	4.5-5.5	Low-----------	0.43	5	1-3
Rosebloom silt loam	5-62	20-35	1.40-1.55	0.6-2.0	0.18-0.21	4.5-5.5	Low-----------	0.37		
Rt---------------	0-22	15-25	1.40-1.55	0.6-2.0	0.20-0.24	5.1-6.5	Low-----------	0.49	5	.5-2
Routon silt loam	22-57	20-35	1.35-1.50	0.06-0.2	0.18-0.22	5.1-6.5	Low-----------	0.49		
	57-72	18-27	1.35-1.55	0.06-0.2	0.20-0.24	5.1-7.3	Low-----------	0.49		
SmE2-------------	0-12	2-15	1.40-1.50	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28	5	.5-2
Smithdale fine	12-50	18-33	1.40-1.55	0.6-2.0	0.15-0.17	4.5-5.5	Low-----------	0.24		
sandy loam	50-65	12-27	1.40-1.55	2.0-6.0	0.14-0.16	4.5-5.5	Low-----------	0.28		

TABLE 16.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Map symbol and soil name	Hydrologic group	Flooding			High water table			Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Uncoated steel	Concrete
					Ft				
Ad: Adler silt loam	C	Occasional	Very brief to long.	Jan-Apr	2.0-3.0	Apparent	Jan-Apr	Moderate	Low.
Ak: Arkabutla silt loam	C	Occasional	Brief to very long.	Jan-Apr	1.0-1.5	Apparent	Jan-Apr	High	High.
Ar: Arkabutla silt loam	C	Frequent	Brief to very long.	Jan-Apr	1.0-1.5	Apparent	Jan-Apr	High	High.
Ca: Calhoun silt loam	D	None	---	---	0-2.0	Perched	Dec-Apr	High	Moderate.
Cb: Calloway silt loam	C	None	---	---	1.0-2.0	Perched	Jan-Apr	High	Moderate.
Cn: Center silt loam	C	None	---	---	1.0-2.5	Apparent	Dec-Mar	High	Moderate.
GrB2, GrB3, GrC3: Grenada silt loam	C	None	---	---	1.5-2.5	Perched	Jan-Apr	Moderate	Moderate.
LeB3, LeC3, LeD3: Lexington silt loam	B	None	---	---	>6.0	---	---	Moderate	Moderate.
LoB2, LoB3, LoC3, LoD3, LoE3: Loring silt loam	C	None	---	---	1.5-2.5	Perched	Dec-Mar	Moderate	Moderate.
MeB2, MeC3, MeD3, MeE3: Memphis silt loam	B	None	---	---	>6.0	---	---	Moderate	Moderate.
Mo: Morganfield silt loam	B	Occasional	Brief	Jan-Apr	3.0-4.0	Apparent	Jan-Apr	Low	Low.
Ro: Rosebloom silt loam	D	Frequent	Brief to long.	Jan-Apr	0-1.0	Apparent	Jan-Apr	High	High.
RS: Rosebloom silt loam	D	Frequent	Brief to long.	Jan-Apr	+2-1.0	Apparent	Dec-Jun	High	High.
Rt: Routon silt loam	D	None	---	---	0-1.0	Apparent	Dec-Apr	High	Moderate.
SmE2: Smithdale fine sandy loam	B	None	---	---	>6.0	---	---	Low	Moderate.

TABLE 17.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Adler	Coarse-silty, mixed, nonacid, thermic Aquic Udifluvents
Arkabutla	Fine-silty, mixed, acid, thermic Aeric Fluvaquents
Calhoun	Fine-silty, mixed, thermic Typic Glossaqualfs
Calloway	Fine-silty, mixed, thermic Glossaquic Fragiudalfs
Center	Fine-silty, mixed, thermic Aquic Hapludalfs
Grenada	Fine-silty, mixed, thermic Glossic Fragiudalfs
Lexington	Fine-silty, mixed, thermic Typic Paleudalfs
Loring	Fine-silty, mixed, thermic Typic Fragiudalfs
Memphis	Fine-silty, mixed, thermic Typic Hapludalfs
Morganfield	Coarse-silty, mixed, nonacid, thermic Typic Udifluvents
Rosebloom	Fine-silty, mixed, acid, thermic Typic Fluvaquents
Routon	Fine-silty, mixed, thermic Typic Ochraqualfs
Smithdale	Fine-loamy, siliceous, thermic Typic Hapludults

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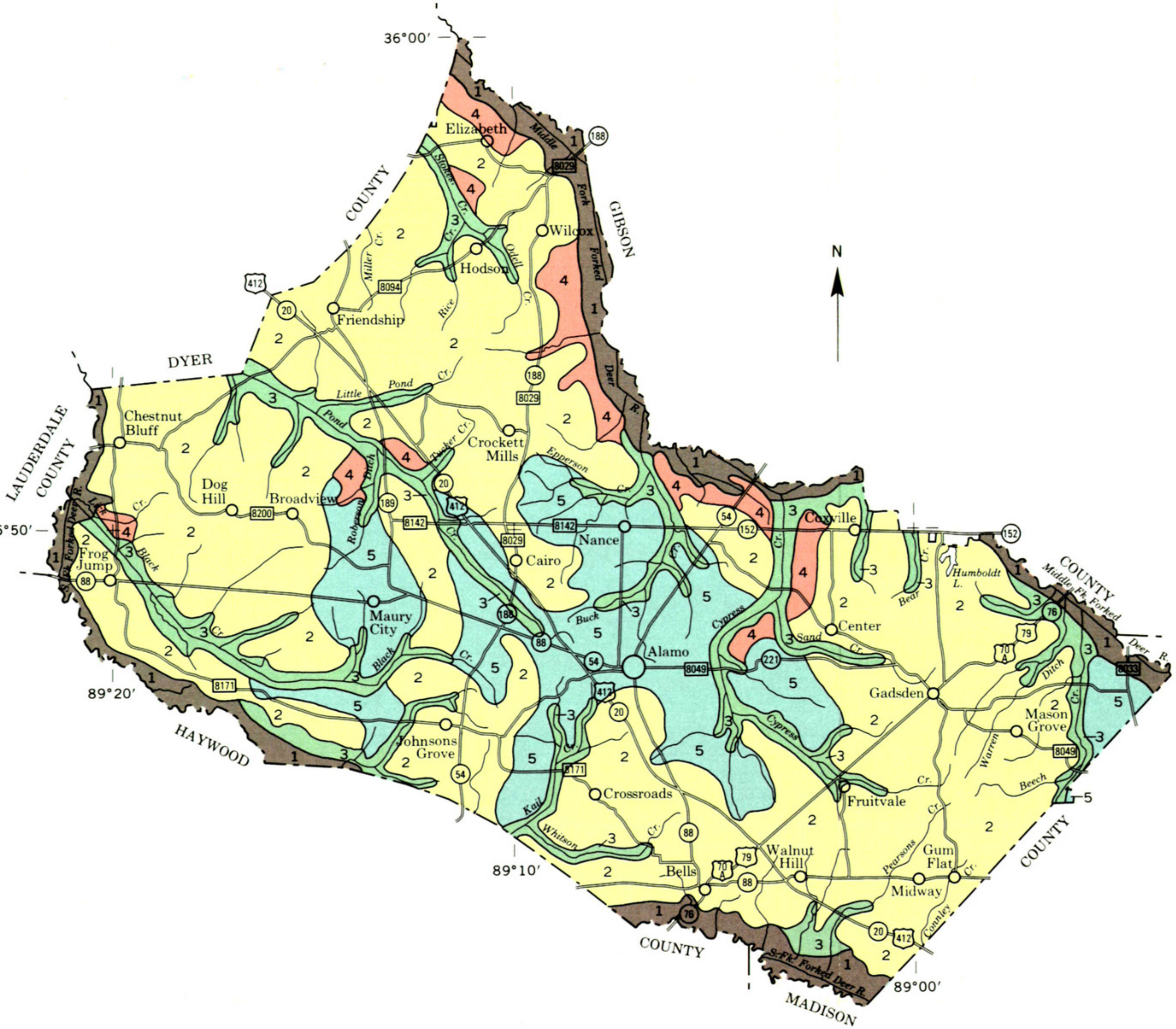


LEGEND

1	ARKABUTLA-ROSEBLOOM: Nearly level, somewhat poorly drained and poorly drained soils; on flood plains
2	GRENADA-LORING-ADLER: Nearly level to moderately steep, moderately well drained soils; on uplands and narrow flood plains
3	ADLER-MORGANFIELD-ARKABUTLA: Nearly level, well drained to somewhat poorly drained soils; on flood plains
4	CENTER-ROUTON-CALHOUN: Nearly level, somewhat poorly drained and poorly drained soils; on loess-covered stream terraces and low uplands
5	GRENADA-LORING-CENTER: Nearly level to strongly sloping, moderately well drained and somewhat poorly drained soils; on uplands and loess-covered stream terraces

COMPILED 1986

UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE
TENNESSEE AGRICULTURAL EXPERIMENT STATION

GENERAL SOIL MAP

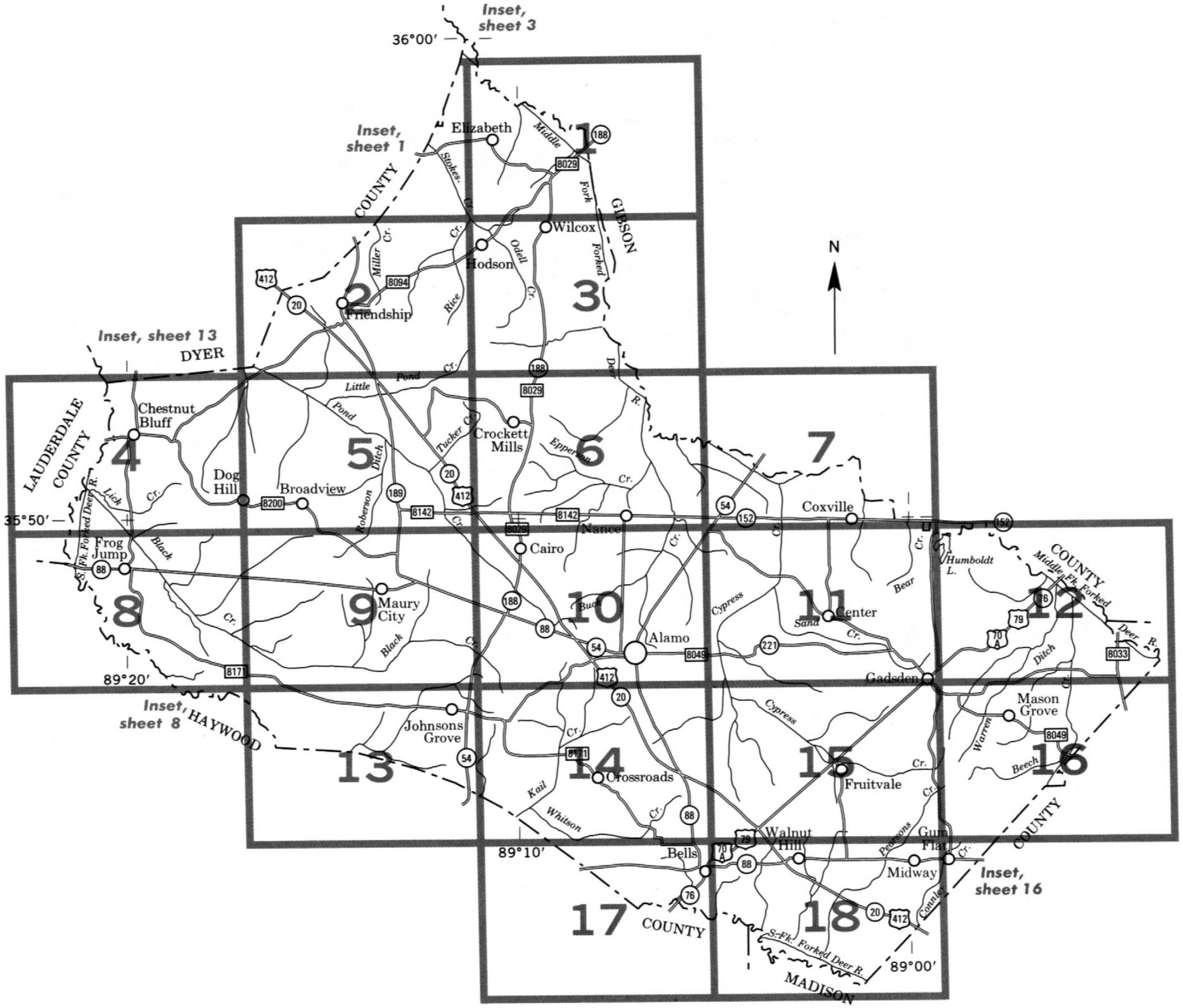
CROCKETT COUNTY, TENNESSEE

Scale 1:190,080

1 0 1 2 3 Miles

1 0 3 6 Km

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.



INDEX TO MAP SHEETS

CROCKETT COUNTY, TENNESSEE

Scale 1:190,080

1 0 1 2 3 Miles

1 0 3 6 Km

SOIL LEGEND

Soil map symbols and map unit names are alphabetical. The first letter, always a capital, is the initial letter of the soil series name. The second letter is a small letter except in order three map units, in which case, it is a capital letter. Order three map units are further indicated by the footnote 1/. The third letter, if used, is always a capital and indicates the slope. Symbols without slope letters are those of nearly level soils. A final number 2 in the symbol indicates that the soil is eroded. A final number 3 indicates that the soil is severely eroded.

SYMBOL	NAME
Ad	Adler silt loam, occasionally flooded
Ak	Arkabutla silt loam, occasionally flooded
Ar	Arkabutla silt loam, frequently flooded
Ca	Calhoun silt loam
Cb	Calloway silt loam
Cn	Center silt loam
GrB2	Grenada silt loam, 2 to 5 percent slopes, eroded
GrB3	Grenada silt loam, 2 to 5 percent slopes, severely eroded
GrC3	Grenada silt loam, 5 to 8 percent slopes, severely eroded
LeB3	Lexington silt loam, 2 to 5 percent slopes, severely eroded
LeC3	Lexington silt loam, 5 to 8 percent slopes, severely eroded
LeD3	Lexington silt loam, 8 to 12 percent slopes, severely eroded
LoB2	Loring silt loam, 2 to 5 percent slopes, eroded
LoB3	Loring silt loam, 2 to 5 percent slopes, severely eroded
LoC3	Loring silt loam, 5 to 8 percent slopes, severely eroded
LoD3	Loring silt loam, 8 to 12 percent slopes, severely eroded
LoE3	Loring silt loam, 12 to 20 percent slopes, severely eroded
MeB2	Memphis silt loam, 2 to 5 percent slopes, eroded
MeC3	Memphis silt loam, 5 to 8 percent slopes, severely eroded
MeD3	Memphis silt loam, 8 to 12 percent slopes, severely eroded
MeE3	Memphis silt loam, 12 to 20 percent slopes, severely eroded
Mo	Morganfield silt loam, occasionally flooded
Ro	Rosebloom silt loam, frequently flooded
RS	Rosebloom silt loam, ponded 1/
Rt	Routon silt loam
SmE2	Smithdale fine sandy loam, 12 to 20 percent slopes, eroded

1/ Order three map units are more variable than other map units in the survey area. Fewer examinations were made in delineated areas. Map units were designed primarily for wildlife habitat management and woodland management and are adequate for interpretations for these uses.

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline and neatline

AD HOC BOUNDARY (label)

- Small airport, airfield, park, oilfield, cemetery, or flood pool (Swift Airport; FLOOD POOL LINE)

STATE COORDINATE TICK

LAND DIVISION CORNER (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEM & DESIGNATIONS

- Interstate (21)
- Federal (173)
- State (28)
- County, farm or ranch (1283)

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or Small (water)

PITS (w)

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label) (Indian Mound)
- Located object (label) (Tower)
- Tank (label) (Gas)
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label) (CANAL)
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial (water; w)
- Intermittent (int; i)

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS (Ar; Mo)

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

GULLY

DEPRESSION OR SINK

SOIL SAMPLE (normally not shown)

MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot
- Gaging Station

CROCKETT COUNTY, TENNESSEE — SHEET NUMBER 1

CROCKETT COUNTY, TENNESSEE NO. 1
This map is compiled on 1979 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies.
Coordinate grid ticks and land division corners, if shown, are approximately positioned.

(2)

N

Scale - 1:24 000

10 000 Feet

3 Kilometers

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CROCKETT COUNTY, TENNESSEE NO. 3

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CROCKETT COUNTY, TENNESSEE NO. 4

CROCKETT COUNTY, TENNESSEE — SHEET NUMBER 5

5

N

Scale - 1:24 000

10 000 Feet

3 Kilometers

CROCKETT COUNTY, TENNESSEE NO. 5

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CROCKETT COUNTY TENNESSEE NO. 6

CROCKETT COUNTY, TENNESSEE NO. 7

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CROCKETT COUNTY, TENNESSEE — SHEET NUMBER 8

N

10 000 Feet
3 Kilometers

Scale - 1:24 000

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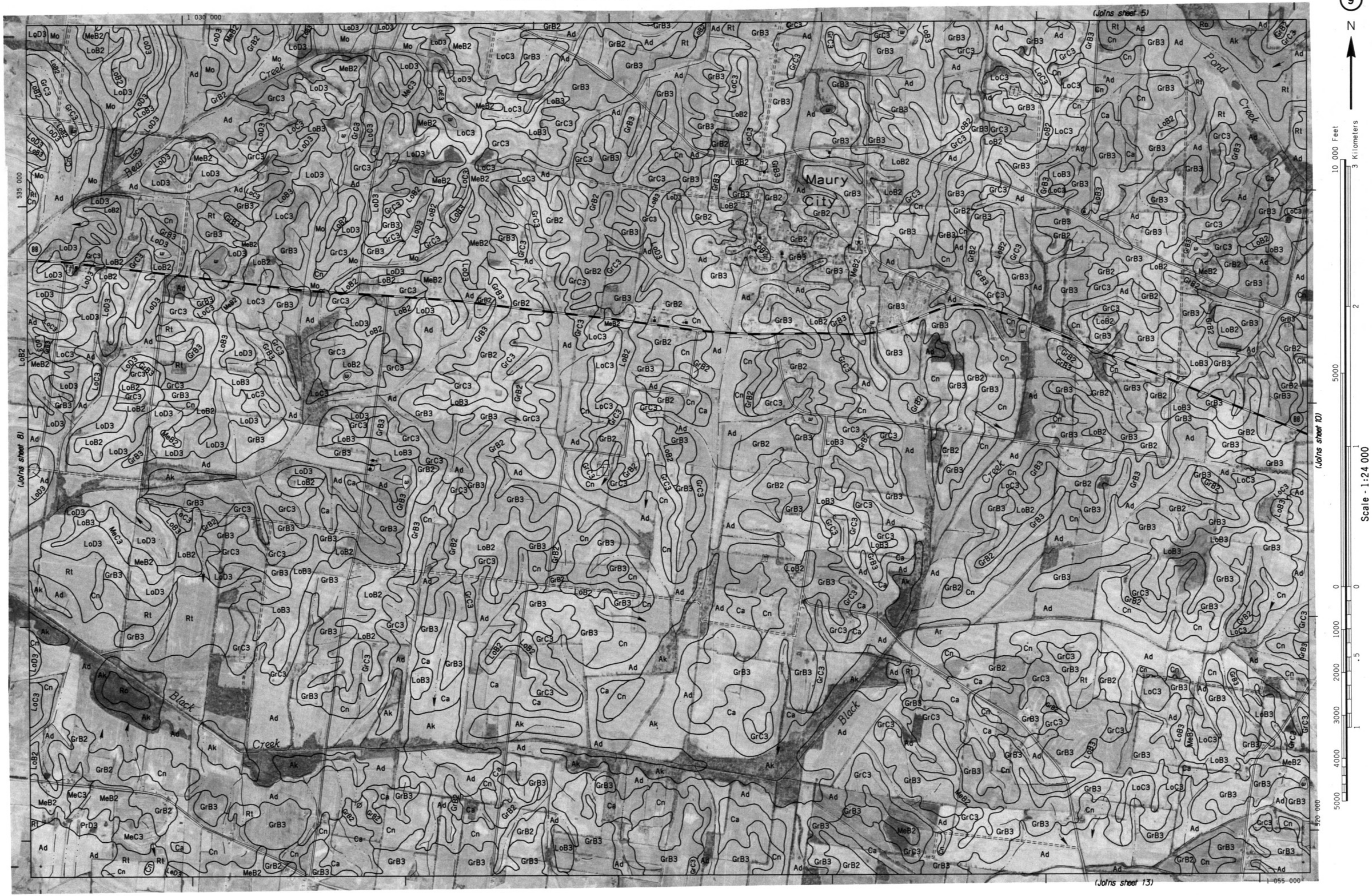

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(10)

CROCKETT COUNTY, TENNESSEE — SHEET NUMBER 10

N

Scale - 1:24 000

10 000 Feet
5000
0
1000
2000
3000
4000
5000

3 Kilometers
2
1
0
.5
1

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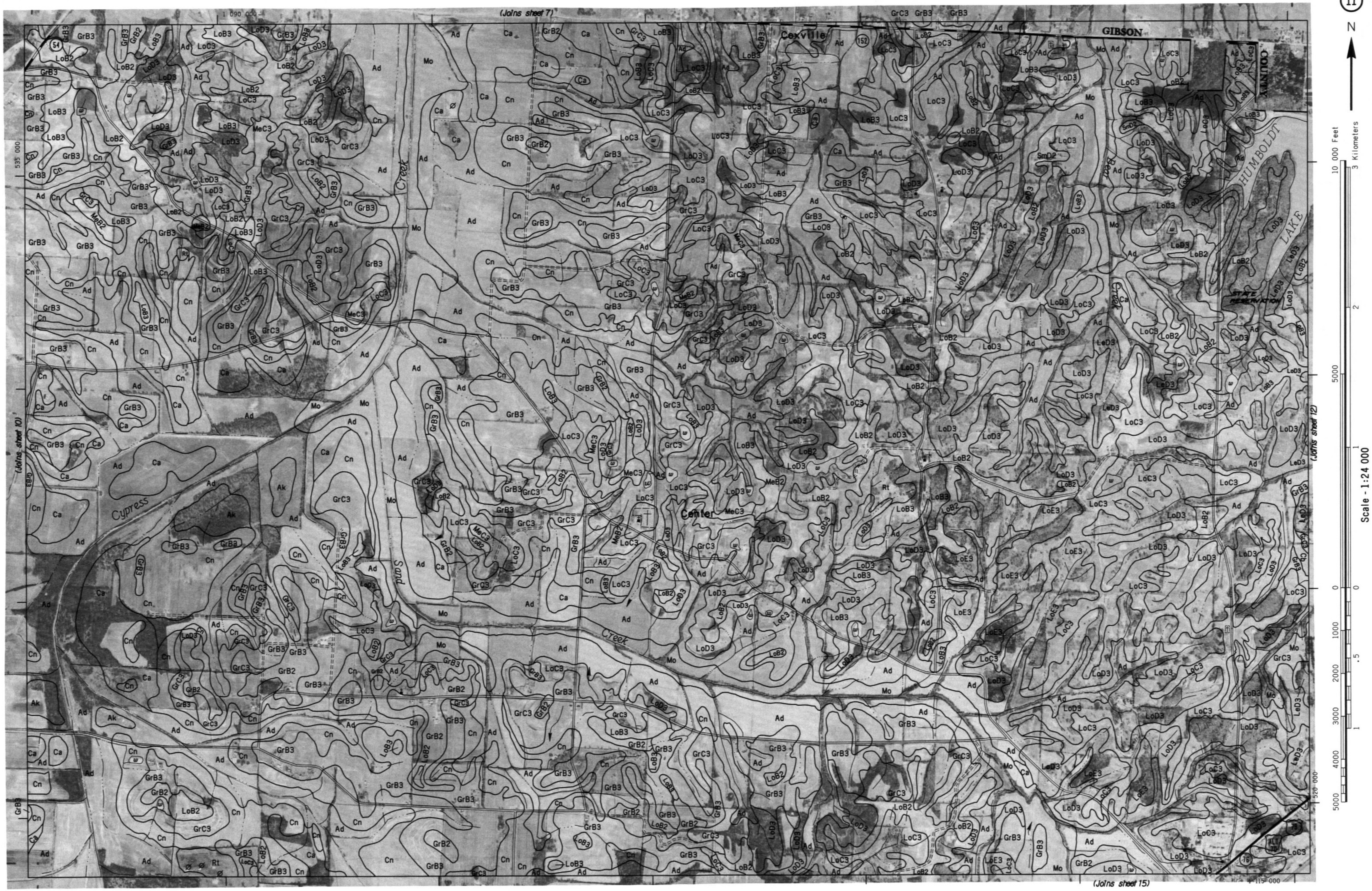
CROCKETT COUNTY, TENNESSEE NO. 10

CROCKETT COUNTY, TENNESSEE — SHEET NUMBER 11



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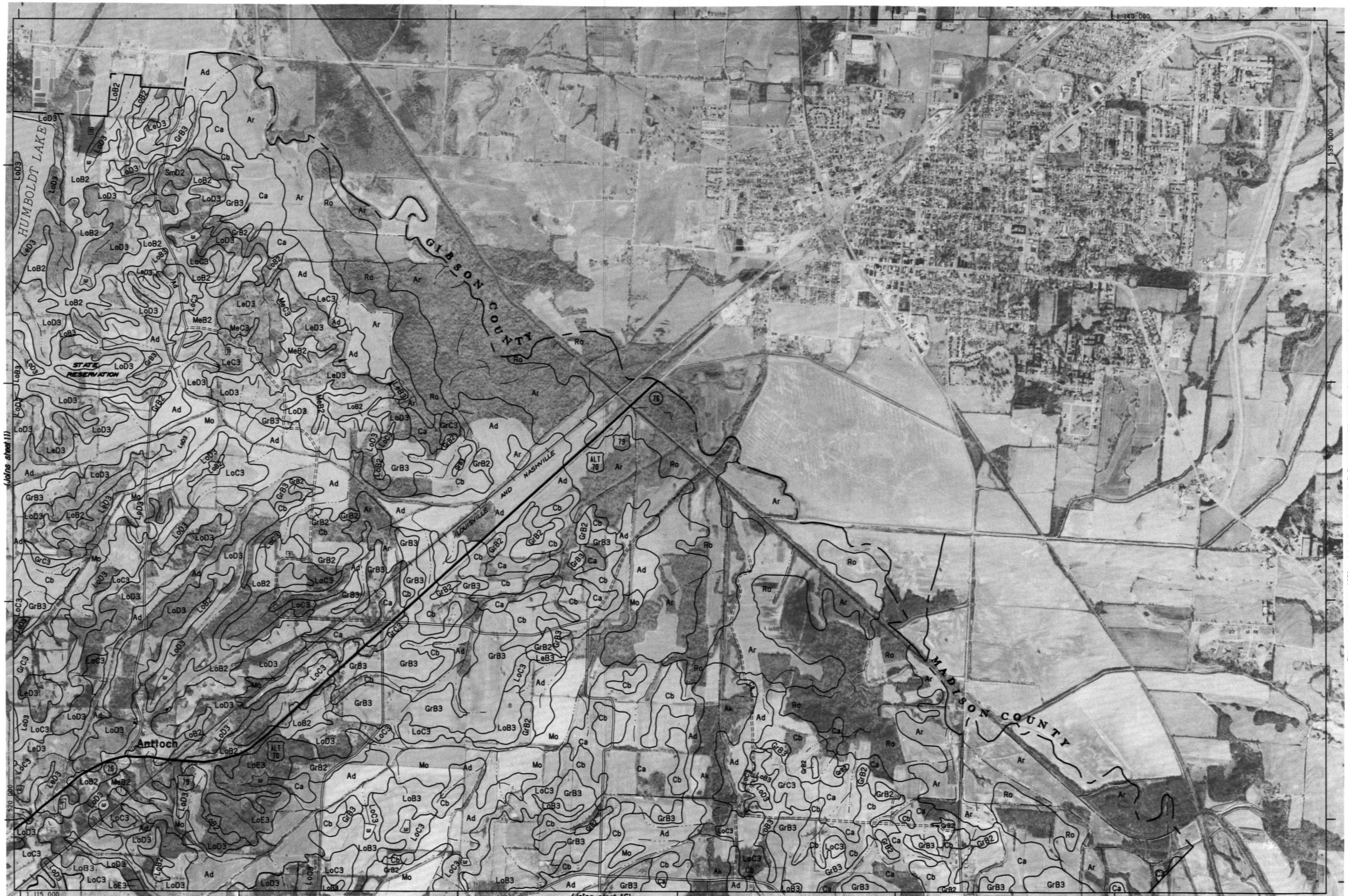
(12)

CROCKETT COUNTY, TENNESSEE — SHEET NUMBER 12

N

Scale - 1:24 000



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CROCKETT COUNTY, TENNESSEE NO. 12

CROCKETT COUNTY, TENNESSEE NO. 13

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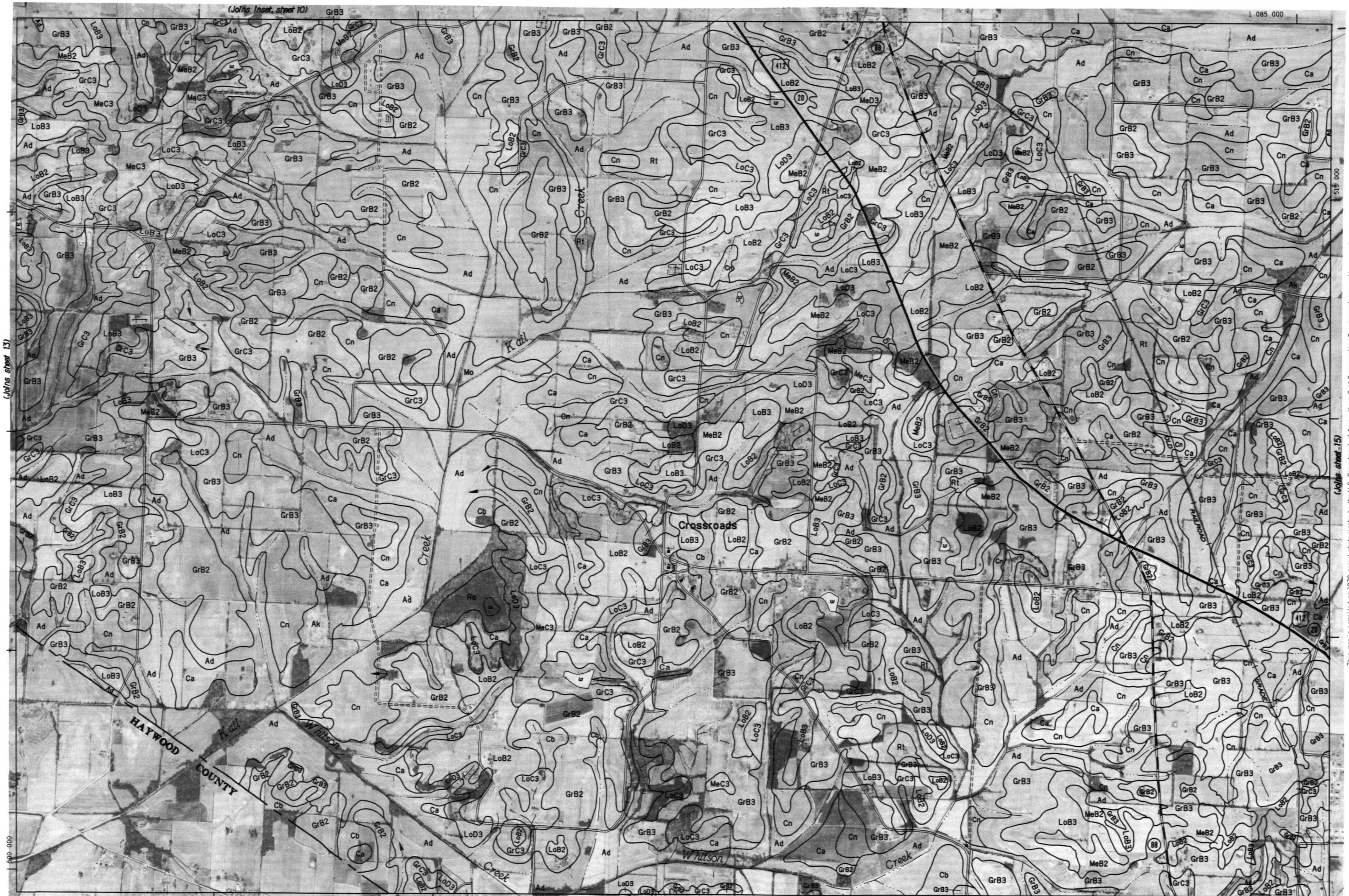
CROCKETT COUNTY, TENNESSEE — SHEET NUMBER 14

N

Scale - 1:24 000

10 000 Feet 5000 0 1000 2000 3000 4000 5000

3 Kilometers 2 1 0 .5 1



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CROCKETT COUNTY, TENNESSEE — SHEET NUMBER 15

15

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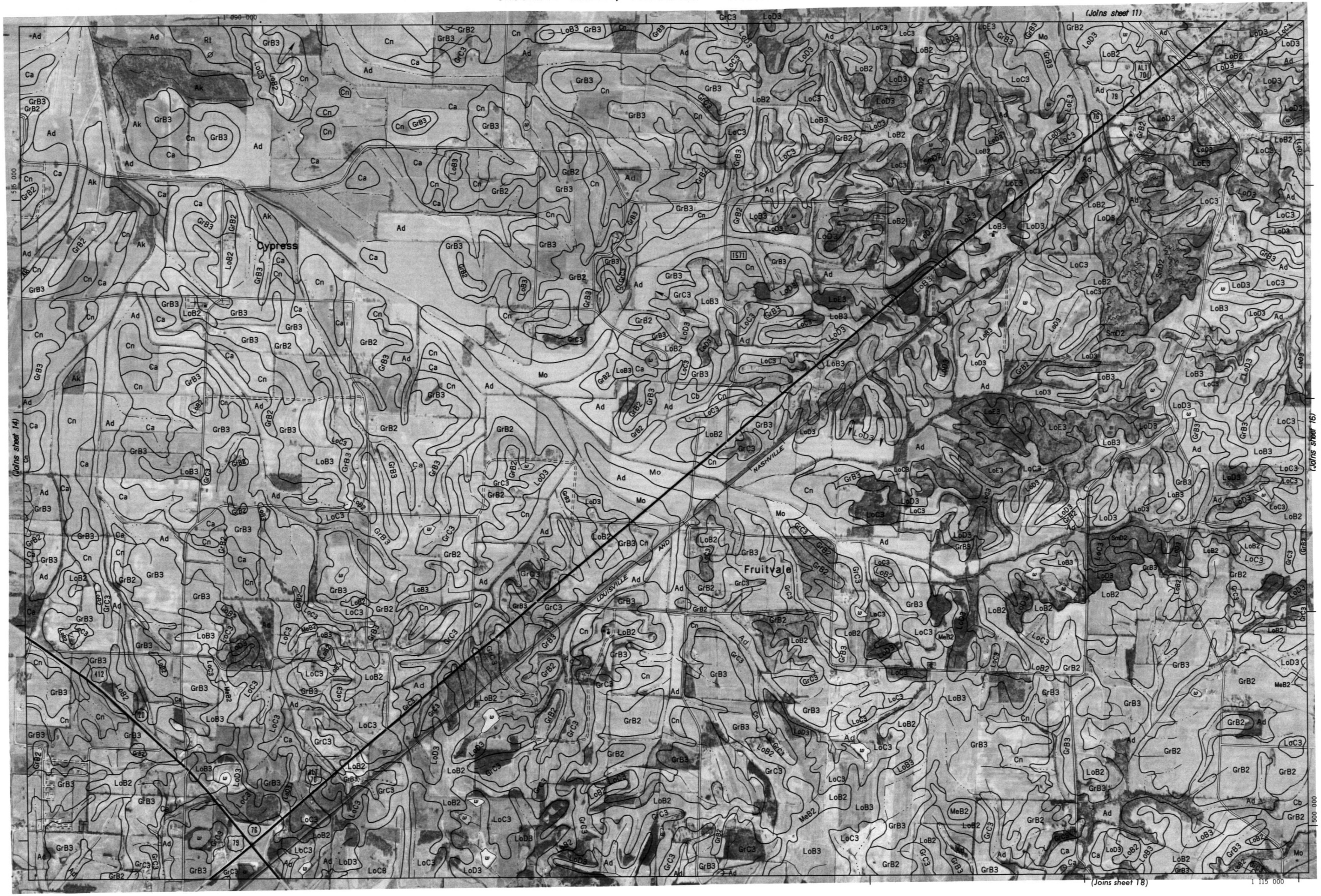


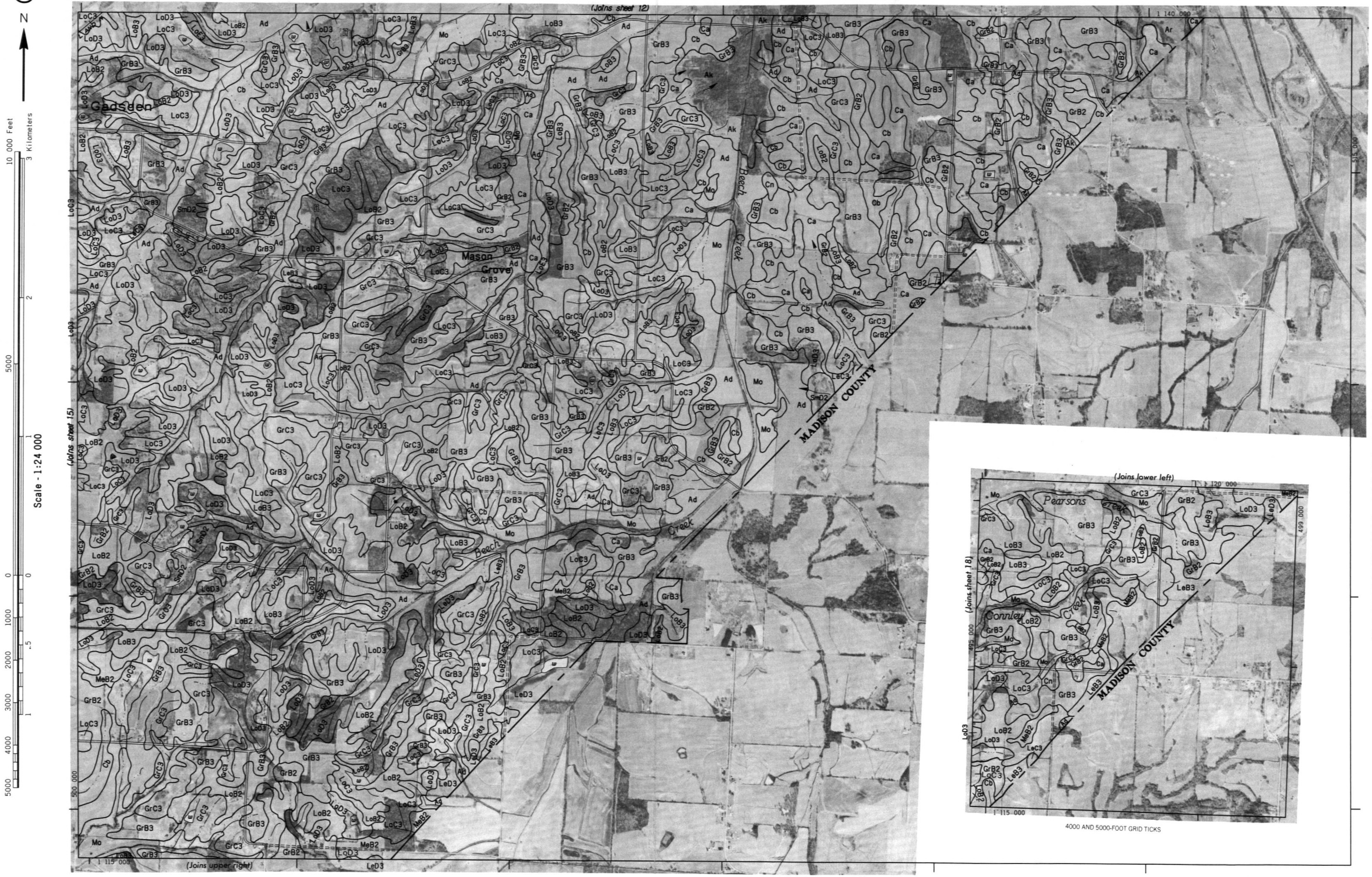
N

Scale - 1:24 000

10 000 Feet: 5000, 0, 1000, 2000, 3000, 4000, 5000

3 Kilometers: 2, 1, 0, .5, 1

CROCKETT COUNTY, TENNESSEE — SHEET NUMBER 16



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CROCKETT COUNTY, TENNESSEE NO. 16

CROCKETT COUNTY, TENNESSEE NO. 17

This map is compiled on 1979 aerial photography by the U.S. Department of Agriculture, Soil Conservation Service and cooperating agencies. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

CROCKETT COUNTY, TENNESSEE — SHEET NUMBER 18

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Scale - 1:24 000

10 000 Feet — 5000 — 0 — 1000 — 2000 — 3000 — 4000 — 5000

3 Kilometers — 2 — 1 — 0 — .5 — 1

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CROCKETT COUNTY, TENNESSEE NO. 18